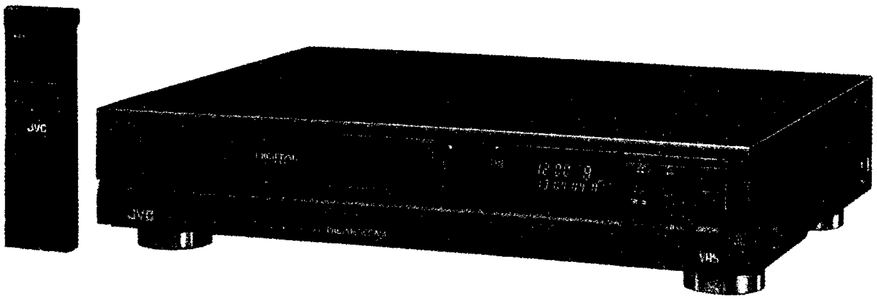
JVC

# SERVICE MANUAL

## VIDEO CASSETTE RECORDER VHS PAL

# HR-D540EE



## SPECIFICATIONS

### GENERAL

| | |
|---|---|
| Power requirement | : AC 220 V∿, 50/60 Hz |
| Power consumption | : 22 W |
| Temperature | : 5°C to 40°C (Operating)<br>: –20°C to 60°C (Storage) |
| Operating position | : Horizontal only |
| Dimensions (WxHxD) | : 435 x 94 x 322 mm |
| Weight | : 5.3 kg |
| Format | : VHS PAL standard |
| Tape width | : 12.65 mm |
| Tape speed | : 23.39 mm/sec |
| Maximum recording time | : 240 min. with E-240 video cassette |

### VIDEO

| | |
|---|---|
| Signal system | : PAL colour and CCIR monochrome signals, 625 lines/50 fields (See "WARNING") |
| Recording system | : Rotary, slant azimuth two-head helical scan system |
| Input | : 0.5 to 2.0 Vp-p, 75 ohms, unbalanced |
| Output | : 1.0 Vp-p, 75 ohms, unbalanced |
| Signal-to-noise ratio | : 43 dB (Rohde & Schwarz noise meter) |
| Horizontal resolution | : 250 lines |

### AUDIO

| | |
|---|---|
| Recording system | : Longitudinal track |
| Input | : –3.8 dBs, (CENELEC standard), more than 50 k-ohms, unbalanced |
| Output | : –3.8 dBs, (CENELEC standard), less than 1 k-ohm, unbalanced (100 k-ohms, load) |
| Frequency range | : 70 Hz to 10,000 Hz |

### TUNER

| | |
|---|---|
| Tuning system | : Voltage synthesized tuner |
| TV channel storage capacity | : 48 positions (+ AUX position "AU") |
| Channel coverage | : VHF 47 — 111 MHz<br>111 — 300 MHz<br>UHF 470 — 862 MHz |
| Aerial output | : UHF channel 36 (adjustable 32 — 40) |

### TIMER

| | |
|---|---|
| Clock reference | : Quartz-crystal |
| Programme capacity | : 1-year/8-programme timer |
| Memory back-up time | : 60 min. |

### ACCESSORIES

| | |
|---|---|
| Provided accessories | : Aerial cable,<br>Infrared remote control unit,<br>"R6" battery x 2,<br>Video cassette tape |
| Optional accessory | : VPS adapter VU-V110E |

*Design and specifications subject to change without notice.*

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**No. 82203**
**October 1990**

**NOTE: For a technical description, please refer to Technical Guide VTG82052 HR-D540/D580/D660 PAL.**

# TABLE OF CONTENTS

**Section Title Page**

**Important Safety Precautions**

**INSTRUCTIONS**

**1. DISASSEMBLY AND MECHANISM ADJUSTMENTS**

1.1 DISASSEMBLY ........ 1-1
  1.1.1 Top cover ........ 1-1
  1.1.2 Front panel assembly ........ 1-1
  1.1.3 Bottom cover ........ 1-1
  1.1.4 Main board assembly ........ 1-1
  1.1.5 Cassette housing ........ 1-2
  1.1.6 Cassette housing installation ........ 1-2
  1.1.7 Cassette housing door ........ 1-3
  1.1.8 Mind-deck ........ 1-3
1.2 MECHANISM ADJUSTMENTS ........ 1-4
  1.2.1 Precautions ........ 1-4
  1.2.2 Check without cassette housing ........ 1-4
  1.2.3 Manually removing cassette tape ........ 1-4
  1.2.4 Test equipment ........ 1-4
1.3 MAIN MECHANISM PARTS ........ 1-5
1.4 INSPECTION AND MAINTENANCE ........ 1-7
  1.4.1 Suggested servicing schedule for main components ........ 1-7
1.5 MAIN PARTS REMOVAL AND REPLACEMENT ........ 1-8

**2. ELECTRICAL ADJUSTMENTS**

2.1 PREPARATION ........ 2-1
  2.1.1 Required test equipment ........ 2-1
  2.1.2 Check and adjustment steps ........ 2-2
2.2 SWITCHING REGULATOR CIRCUIT ........ 2-3
2.3 TIMER CIRCUIT ........ 2-3
2.4 SERVO CIRCUIT ........ 2-4
2.5 VIDEO CIRCUIT ........ 2-5
2.6 AUDIO CIRCUIT ........ 2-7
2.7 TUNE/IF CIRCUIT ........ 2-7

**3. CHARTS AND DIAGRAMS**

3.1 CIRCUIT BOARD AND LOCATION ........ 3-1
3.2 GENERAL INFORMATION ........ 3-2
  3.2.1 Connections ........ 3-2
  3.2.2 Disconnecting the flatwire ........ 3-2
  3.2.3 Indications ........ 3-2
  3.2.4 Schematic diagram values ........ 3-2
  3.2.5 Signal flow in the schematic ........ 3-2
  3.2.6 Semiconductors ........ 3-3
  3.2.7 Replacement of chip parts ........ 3-3
3.3 BOARD INTERCONNECTIONS ........ 3-5
3.4 VIDEO BLOCK DIAGRAM ........ 3-7
3.5 PRE/REC BLOCK DIAGRAM ........ 3-9
3.6 SERVO BLOCK DIAGRAM ........ 3-11
3.7 AUDIO BLOCK DIAGRAM ........ 3-13
3.8 SYSTEM CTL BLOCK DIAGRAM ........ 3-15
3.9 POWER TRANS, POWER TRANSISTOR & REGULATOR (MAIN) SCHEMATIC DIAGRAM ........ 3-17
3.10 SWITCHING REGULATOR CIRCUIT BOARD ........ 3-19
3.11 SERVO SCHEMATIC DIAGRAM ........ 3-21
3.12 AUDIO SCHEMATIC DIAGRAM ........ 3-23
3.13 SYSTEM CTL SCHEMATIC DIAGRAM ........ 3-25
3.14 DECK TERMINAL, MODE MOTOR, CAPSTAN MDA, C. HOUSING SCHEMATIC DIAGRAM ........ 3-27
3.15 DECK TERMINAL, MODE MOTOR, C. HOUSING, A/C HEAD CIRCUIT BOARDS ........ 3-28
3.16 MAIN CIRCUIT BOARD ........ 3-29
3.17 VIDEO UNIT & VIDEO (MAIN) SCHEMATIC DIAGRAM ........ 3-31

**Section Title Page**

3.18 VIDEO UNIT CIRCUIT BOARD ........ 3-33
3.19 IF & TNR CTL SCHEMATIC DIAGRAM ........ 3-35
3.20 IF & TNR CTL CIRCUIT BOARD ........ 3-37
3.21 TIMER/DISP/SW SCHEMATIC DIAGRAM ........ 3-39
3.22 TIMER/DISP/SW CIRCUIT BOARD ........ 3-41
3.23 PRE/REC SCHEMATIC DIAGRAM ........ 3-43
3.24 PRE/REC CIRCUIT BOARD ........ 3-45
3.25 REMOTE CONTROL SCHEMATIC DIAGRAM ........ 3-47
3.26 RF CONVERTER SCHEMATIC DIAGRAM ........ 3-48

**4. EXPLODED VIEWS AND PARTS LIST**

4.1 PACKING ASSEMBLY <M1> ........ 4-1
4.2 CABINET ASSEMBLY <M2> ........ 4-2
4.3 CHASSIS ASSEMBLY <M3> ........ 4-3
4.4 MECHANISM ASSEMBLY <M4> ........ 4-4

**5. ELECTRICAL PARTS LIST**

POWER TRANSFORMER BOARD ASSEMBLY <01><02> . 5-1
MAIN BOARD ASSEMBLY <03> ........ 5-3
VIDEO UNIT BOARD ASSEMBLY <05> ........ 5-7
IF BOARD ASSEMBLY <07> ........ 5-9
TUNER CONTROL BOARD ASSY <08> ........ 5-11
AUDIO CONTROL HEAD BOARD <12> ........ 5-12
T/D/S BOARD ASSEMBLY <21> ........ 5-12
UPPER DRUM BOARD <41> ........ 5-13
PRE/REC AMP BOARD ASSEMBLY <43> ........ 5-13
DECK TERMINAL BOARD ASSEMBLY <51> ........ 5-14
LOADING MDA BOARD ASSEMBLY <55> ........ 5-15
CASSETTE HOUSING BOARD <56> ........ 5-15

**6. TECHNICAL INFORMATIONS**

6.1 CIRCUIT CONTROL SYSTEM ........ 6-1

# Important Safety Precautions

Prior to shipment from the factory, JVC products are strictly inspected to conform with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

## ● Precautions during Servicing

1. Locations requiring special caution are denoted by labels and inscriptions on the cabinet, chassis and certain parts of the product. When performing service, be sure to read and comply with these and other cautionary notices appearing in the operation and service manuals.

2. Parts identified by the ⚠ symbol and shaded (▨) parts are critical for safety.
Replace only with specified part numbers.
**Note: Parts in this category also include those specified to comply with X-ray emission standards for products using cathode ray tubes and those specified for compliance with various regulations regarding spurious radiation emission.**

3. Fuse replacement caution notice.
Caution for continued protection against fire hazard.
Replace only with same type and rated fuse(s) as specified.

4. Use specified internal wiring. Note especially:
   1) Wires covered with PVC tubing
   2) Double insulated wires
   3) High voltage leads

5. Use specified insulating materials for hazardous live parts. Note especially:
   1) Insulation Tape
   2) PVC tubing
   3) Spacers
   4) Insulation sheets for transistors
   5) Barrier

6. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.) wrap ends of wires securely about the terminals before soldering.

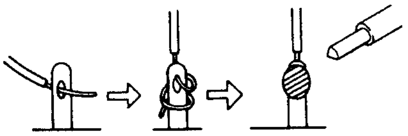


Fig. 1

7. Observe that wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.)

8. Check that replaced wires do not contact sharp edged or pointed parts.

9. When a power cord has been replaced, check that 10–15 kg of force in any direction will not loosen it.

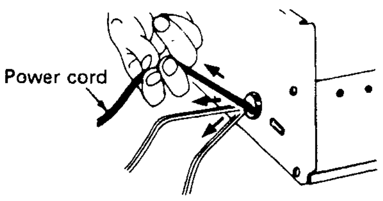


Fig. 2

10. Also check areas surrounding repaired locations.

11. Products using cathode ray tubes (CRTs)
In regard to such products, the cathode ray tubes themselves, the high voltage circuits, and related circuits are specified for compliance with recognized codes pertaining to X-ray emission. Consequently, when servicing these products, replace the cathode ray tubes and other parts with only the specified parts. Under no circumstances attempt to modify these circuits. Unauthorized modification can increase the high voltage value and cause X-ray emission from the cathode ray tube.

12. Crimp type wire connector
In such cases as when replacing the power transformer in sets where the connections between the power cord and power transformer primary lead wires are performed using crimp type connectors, if replacing the connectors is unavoidable, in order to prevent safety hazards, perform carefully and precisely according to the following steps.
   1) **Connector part number** : E03830-001
   2) **Required tool** : Connector crimping tool of the proper type which will not damage insulated parts.
   3) **Replacement procedure**
      (1) Remove the old connector by cutting the wires at a point close to the connector.
      Important : Do not reuse a connector (discard it).

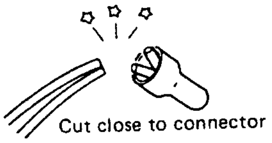


Fig. 3

(2) Strip about 15 mm of the insulation from the ends of the wires. If the wires are stranded, twist the strands to avoid frayed conductors.

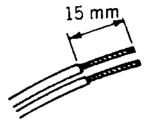


Fig. 4

(3) Align the lengths of the wires to be connected. Insert the wires fully into the connector.

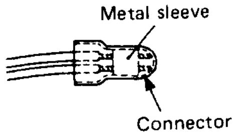


Fig. 5

(4) As shown in Fig. 6, use the crimping tool to crimp the metal sleeve at the center position. Be sure to crimp fully to the complete closure of the tool.

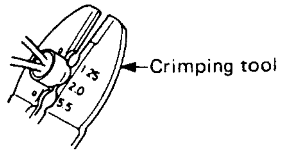


Fig. 6

(5) Check the four points noted in Fig. 7.

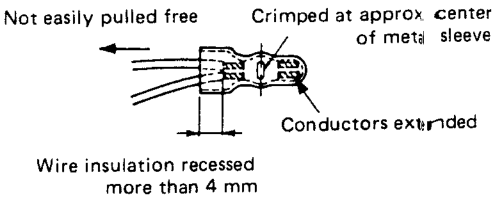

Not easily pulled free
Crimped at approx. center of metal sleeve
Conductors extended
Wire insulation recessed more than 4 mm

Fig. 7

## ● Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions, Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

1. **Insulation resistance test**
   Confirm the specified insulation resistance or greater between power cord plug prongs and externally exposed parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

2. **Dielectric strength test**
   Confirm specified dielectric strength or greater between power cord plug prongs and exposed accessible parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

3. **Clearance distance**
   When replacing primary circuit components, confirm specified clearance distance (d), (d') between soldered terminals, and between terminals and surrounding metallic parts. See table 1 below.

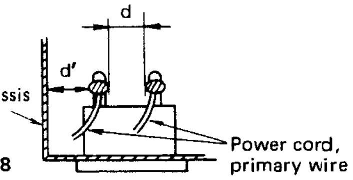


**Fig. 8**

4. **Leakage current test**
   Confirm specified or lower leakage current between earth ground/power cord plug prongs and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).
   **Measuring Method:** (Power ON)
   Insert load Z between earth ground/power cord plug prongs and externally exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See figure 9 and following table 2.

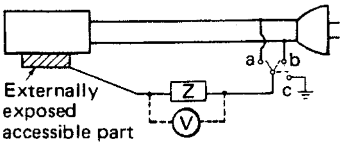


**Fig. 9**

5. **Grounding (Class I model only)**
   Confirm specified or lower grounding impedance between earth pin in AC inlet and externally exposed accessible parts (Video in, Video out, Audio in, Audio out or Fixing screw etc.).
   **Measuring Method:**
   Connect milli ohm meter between earth pin in AC inlet and exposed accessible parts. See figure 10 and grounding specifications.

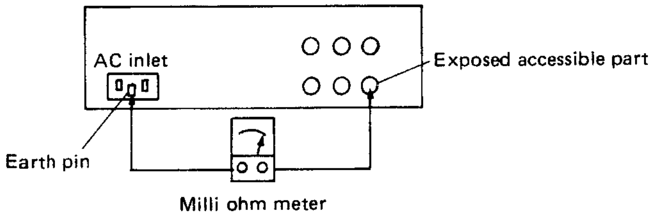


**Fig. 10**

**Grounding Specifications**

| Region | Grounding Impedance (Z) |
|---|---|
| USA & Canada | Z ≦ 0.1 ohm |
| Europe & Australia | Z ≦ 0.5 ohm |

| AC Line Voltage | Region | Insulation Resistance (R) | Dielectric Strength | Clearance Distance (d), (d') |
|---|---|---|---|---|
| 100 V | Japan | R ≧ 1 MΩ/500 V DC | AC 1 kV 1 minute | d, d' ≧ 3 mm |
| 100 to 240 V | | | AC 1.5 kV 1 minute | d, d' ≧ 4 mm |
| 110 to 130 V | USA & Canada | – | AC 900 V 1 minute | d, d' ≧ 3.2 mm |
| 110 to 130 V<br>200 to 240 V | Europe & Australia | R ≧ 10 MΩ /500 V DC | AC 3 kV 1 minute (Class II)<br>AC 1.5 kV 1 minute (Class I) | d ≧ 4 mm<br>d' ≧ 8 mm (Power cord)<br>d' ≧ 6 mm (Primary wire) |

**Table 1** Specifications for each region

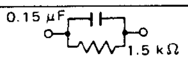
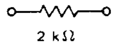
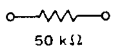
| AC Line Voltage | Region | Load Z | Leakage Current (i) | a, b, c |
|---|---|---|---|---|
| 100 V | Japan | 1 kΩ | i ≦ 1 mA rms | Exposed accessible parts |
| 110 to 130 V | USA & Canada |  0.15 μF<br>1.5 kΩ | i ≦ 0.5 mA rms | Exposed accessible parts |
| 110 to 130 V<br>220 to 240 V | Europe & Australia |  2 kΩ | i ≦ 0.7 mA peak<br>i ≦ 2 mA dc | Antenna earth terminals |
| | |  50 kΩ | i ≦ 0.7 mA peak<br>i ≦ 2 mA dc | Other terminals |

**Table 2** Leakage current specifications for each region

**Note:** These tables are unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

# INSTRUCTIONS

## SAFETY PRECAUTIONS

The rating plate and the safety caution are on the rear of the unit.

**WARNING — DANGEROUS VOLTAGE INSIDE**
**WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE.**

**IMPORTANT (In the United Kingdom)**
**Mains Supply (240 V∿, 50 Hz only)**

**IMPORTANT**

Do not make any connection to the Larger Terminal coded E or Green. The wires in the mains lead are coloured in accordance with the following code:

Blue to N (Neutral) or Black
Brown to L (Live) or Red

If these colours do not correspond with the terminal identifications of your plug, connect as follows:
Blue wire to terminal coded N (Neutral) or coloured Black.
Brown wire to terminal coded L (Live) or coloured Red.
***If in doubt — consult a competent electrician.***

### CAUTION

- When you are not using the recorder for a long period of time, it is recommended that you disconnect the power cord from the AC outlet.
- Dangerous voltage inside. Refer internal servicing to qualified service personnel. To prevent electric shock or fire hazard, remove the power cord from the AC outlet prior to connecting or disconnecting any signal lead or aerial.

**Omkopplaren OPERATE på denna apparat är sekundärt kopplad och skiljer inte apparaten från nätet i läge OPERATE OFF.**

The OPERATE button does not completely shut off mains power from the unit, but switches operating current on and off.

**BEMAERK:** I stilling OFF er apparatet stadig forbundet med lysnettet Hvis det ønskes fuldstændig afbrudt skai netledningen trækkes ud.

This unit is produced to comply with Directives 76/889/EEC, 82/499/EEC, 87/308/EEC and Standard IEC Publ. 65.

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### WARNING

1. In addition to PAL B/G and PAL D/K colour television signals, this recorder can also receive SECAM B/G and SECAM D/K colour television signals. SECAM B/G and SECAM D/K colour television signals can be recorded and played back in colour as far as this same recorder is used for recording and playback.
2. SECAM B/G and SECAM D/K colour television signals recorded on this recorder produce monochrome pictures if played back on another PAL or SECAM recorder.
3. SECAM B/G and SECAM D/K colour television signals recorded on another PAL or SECAM recorder produce monochrome pictures if played back on this recorder.
4. This recorder cannot be used in France. Use in France a recorder which is capable of receiving SECAM L colour television signals.
5. SECAM L prerecorded cassettes or recordings made with a SECAM L video recorder produce monochrome pictures when played back on this recorder.

**IMPORTANT:** It may be unlawful to record or play back copyrighted material without the consent of the copyright owner.

VHS HQ
PAL

- Only cassettes marked "VHS" can be used with this video recorder.
- HQ VHS is compatible with existing VHS equipment.

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## PRECAUTIONS

### VIDEO RECORDER

**Handling and storage**

- Avoid using the recorder under the following conditions:
  - — extremely hot, cold or humid places,
  - — dusty places,
  - — near appliances generating strong magnetic fields,
  - — places subject to vibrations, and
  - — poorly ventilated places.
- Be careful of moisture condensation.
- Avoid using the recorder immediately after moving from a cold place to a warm place. The water vapour in warm air will condense on the still-cold video head drum and tape guides and may cause damage to the tape and the recorder.
- Handle the recorder carefully
  - · Do not block the ventilation openings.
  - · Do not place anything heavy on the recorder.
  - · Do not place anything which might spill and cause trouble on the top cover of the recorder.
  - · Use in horizontal (flat) position only.
- In case of transportation,
  - · Avoid violent shocks to the recorder during packing and transportation.
  - · Before packing, be sure to remove the cassette from the recorder.

**Moisture condensation**

- If you pour a cold liquid into a glass, water vapour in the air will condense on the surface of the glass. This is called moisture condensation.
- Moisture condensation on the head drum, one of the most crucial parts of the video recorder, will cause damage to the tape.
- Moisture condensation is apt to occur under the following conditions:
  - — when the recorder is moved from a cold place to a warm place, and
  - — under extremely humid conditions.
- In conditions where moisture condensation may occur, keep the power cord plugged in an AC outlet and the power switched on; this will help prevent condensation from occurring. When condensation has occurred, it will not evaporate quickly once the power is switched on. Wait a few hours for the recorder to become dry.

### VIDEO CASSETTES

- Avoid exposing the cassettes to direct sunlight. Keep them away from heaters.
- Avoid extreme humidity, violent vibrations or shocks, strong magnetic fields (near a motor, transformer or magnet) and dusty places.
- Place the cassettes in cassette cases and position vertically.

### REMOTE CONTROL UNIT

- Avoid violent shocks, especially take care not to drop the unit.
- Take care not to allow liquid to spill into the unit.
- Do not place heavy objects on the unit.
- Avoid leaving the unit in places subject to direct sunlight or extremely high temperatures.

## CONTENTS

Features ........ 3
Controls, indicators, and connectors
  Front panel ........ 4
  Rear panel ........ 5
  Remote control unit ........ 5
Connections
  Aerial and RF connection ........ 6
  AV connection ........ 6
  Video channel setting ........ 6
Clock setting ........ 7
Operating the built-in tuner ........ 8
Loading and unloading a video cassette ........ 9
  Usable cassettes and their recording time
  Accidental erasure prevention
Playing back a video cassette ........ 10
  Digital Tracking system
Convenient facilities related to playback ........ 11
  Memory play
  Repeat playback
Special-effects playback ........ 12
  High-speed reverse search
  High-speed forward search
  Still playback, frame advance and slow motion
Recording TV programmes ........ 13
  Recording one TV programme while watching another
Convenient facilities related to recording ........ 14
  Realtime tape counter
  Elapsed recording time indication
  Counter memory function
  Remaining tape time indication
  Retake function
Instant timer recording ........ 15
  24-Hour timer
  Off-timer
Automatic timer recording ........ 16
  Local programming
  Direct remote programming
VPS recording ........ 18
Child Lock function ........ 18
Recording from an external source ........ 19
  Editing to another video recorder
  Editing from a VideoMovie
In case of difficulty ........ 20
Head cleaning ........ 21
Specifications ........ 22

# FEATURES

## MAIN FEATURES, ADVANTAGES AND BENEFITS

| Feature | Advantage | Benefit |
|---|---|---|
| **Quick-Response Full-Loading Mechanism** | ■ Quick response: 1.3 seconds from Stop to Play or Record.<br>■ Increased Rewind/Fast-Forward speed. | ■ Immediate, no-frustration operation of VCR.<br>■ Faster Rewind/Fast-Forward saves time. |
| **Digital Tracking** | Microcomputer-controlled tracking system maintains constant optimal video tracking. | Best possible picture performance, even for rental videos, is always assured. |
| **Automatic Repeat Playback (possible up to 5 times)** | ■ Full Repeat: repeated playback of whole tape.<br>■ Index Repeat: repeated playback of segment located between two index codes. | You can repeatedly view a favourite programme with ease. |
| **Dual-system Flexibility** | ■ PAL/MESECAM recording and playback.<br>■ Voltage synthesized wide-band dual tuner with automatic detection of B/G and D/K broadcasts (both PAL and SECAM) and 48-channel preset capacity; can receive VHF and UHF channels.<br>■ G/K dual-system RF converter. | ■ Access to a wider range of programmes.<br>■ Increased television compatibility. |

## OTHER KEY FEATURES

**Flexible timer functions** — Timer programming flexibility thanks to 1-year/8-event timer, 24-hour instant timer, and "off" timer.

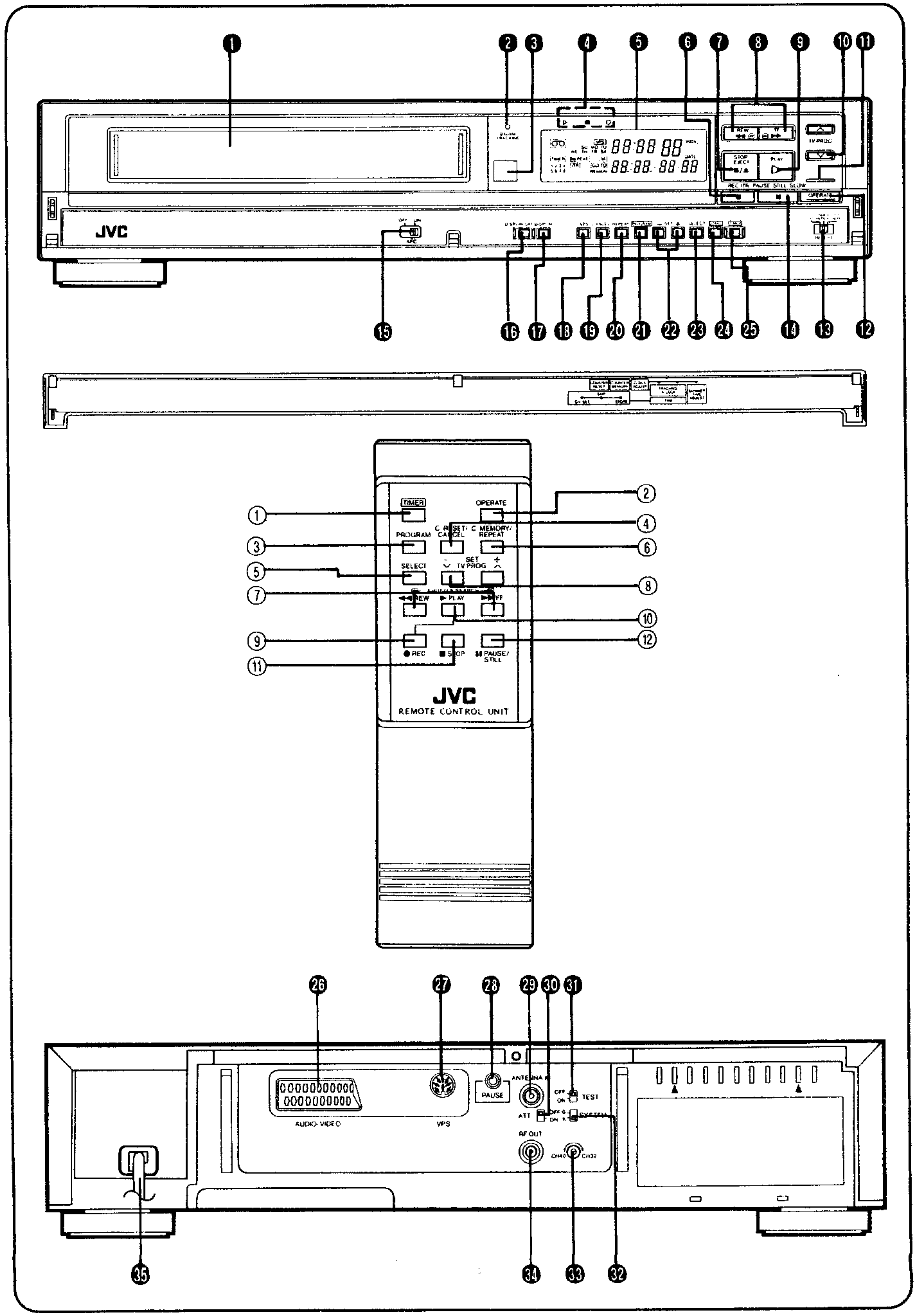
**Quartz clock** — Ensures accurate timekeeping/timer recording even in areas where power fluctuations occur.

**Instant "summer time" adjustment** — One-button adjustment of VCR's clock to and from daylight saving time.

**Child Lock system** — Temporarily disables VCR's controls to deter unwanted operation.

**Display OFF function** — Can switch off FDP to eliminate bothersome light and reduce chances of theft.

**Preroll-capable PAUSE remote control terminal** — For superior quality edits when used in an editing suite.



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⓯ ⓰ ⓱ ⓲ ⓳ ⓴ ㉑ ㉒ ㉓ ㉔ ㉕ ⓮ ⓭ ⓬
JVC
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫
TIMER
OPERATE
PROGRAM
C.RESET/CANCEL
C.MEMORY/REPEAT
SELECT
SET
TV PROG
◀◀REW
▶PLAY
▶▶FF
●REC
■STOP
❚❚PAUSE/STILL
JVC
REMOTE CONTROL UNIT
㉖ ㉗ ㉘ ㉙ ㉚ ㉛
AUDIO-VIDEO
VPS
PAUSE
ANTENNA
TEST
ATT
SYSTEM
RF OUT
CH32
㉟ (34) (33) (32)

# CONTROLS, INDICATORS AND CONNECTORS

Refer to diagrams on the front foldout page.

## Front panel

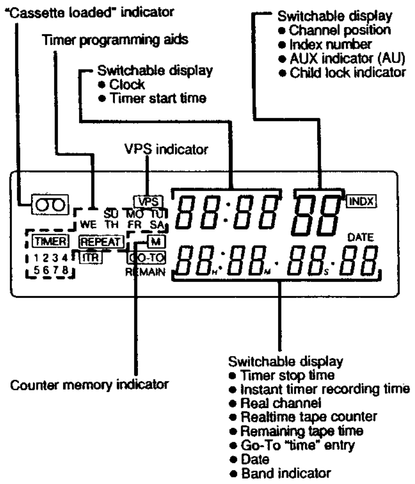
**❶ Cassette loading slot**
Insert a VHS cassette. The door will close and the "cassette loaded" indicator will appear on the FDP (fluorescent display panel).

**❷ DIGITAL TRACKING indicator**
Lights in the Digital Tracking mode.
Blinks while adjusting.

**❸ Infrared beam receiving window**

**❹ Mode indicators**
▷ : Play mode
▷ ⏸ : Still/Slow-Motion mode
▷ ○ : Record mode
▷ ⏸ ○ : Record-Pause mode

**❺ Fluorescent Display Panel (FDP)**



**❻ REC/ITR button**
- Press once to start recording.
- Press twice to engage the Instant Timer Recording mode.
- Also use to set the required recording time in the 24-Hour Instant Timer Set mode.

**❼ STOP/EJECT button**
- Press while in the Stop mode to eject the cassette.
- Press while in other modes to stop the tape.

**❽ REW/FF/Shuttle Search buttons**
- Press while in the Stop mode to rewind or fast-forward the tape.
- Press while in the Play mode for Shuttle Search in the reverse or forward direction.
- Press while in the Record-Pause mode to engage the Retake mode. (See page 14.)

**❾ PLAY button**
- Press to play back a tape.
- Press to cancel the Pause/Still/Slow or Shuttle Search mode. (See page 12.)
- Press to start recording from the Record-Pause mode.

**❿ TV PROG. buttons**
Press either button to scan to a desired channel.

**⓫ OPERATE indicator**

**⓬ OPERATE button**
Press to apply operating power to the recorder. The indicator will light. Loading a cassette also turns the power on.

**⓭ REPEAT switch**

| | |
|---|---|
| FULL REPEAT: | To play back the entire tape repeatedly. |
| INDEX REPEAT: | To play back a segment between two adjacent index codes. (See page 11.) |
| OFF: | No repeat playback. |

**⓮ PAUSE/STILL/SLOW button**
- Press while in the Record mode to stop the tape temporarily to avoid recording of unwanted material.
- Press while in the Play mode to view a still picture.
- The still picture can be advanced each time this button is pressed.
- Keep this button pressed for more than 2 seconds to obtain slow-motion playback.
- Press again to view a still picture.

**⓯ Automatic Frequency Control switch (AFC)**
Normally set to ON.

**⓰ DISPLAY OFF button**
Press to make all indications on the FDP disappear when they are not required; the display will show "-:--". Press again to make the clock display reappear.

**⓱ DISPLAY button**
Press to switch the display among the realtime tape counter, remaining tape time and date. Also press to change the display from the Timer Set mode to the Clock mode.

**⓲ VPS/CH.SET button**
This is a dual-function button.
- as a CH.SET button — press to engage the Real Channel mode.
- as a VPS button — press to enter the VPS command while in the Timer Set mode.

**⓳ CANCEL/COUNTER RESET/SKIP button**
This is a triple-function button.
- as a CANCEL button — press to cancel the programmed data in the Timer Set mode.
- as a COUNTER RESET button — press to reset the realtime counter reading to "0H 00M 00S".
- as a SKIP button — press to skip unnecessary channels in the Real Channel mode.

**⓴ REPEAT/COUNTER MEMORY/STORE button**
This is a triple-function button.
- as a REPEAT button — press to enter the repeat command in the Timer Set mode.
- as a COUNTER MEMORY button — press to engage the Counter Memory mode.
- as a STORE button — press to store the tuned-in channel in the Real Channel mode.

**㉑ PROGRAM/CLOCK ADJUST button**
Press to change the recorder's mode in the following order: Clock mode, Timer Set mode, Clock Set mode, then return to the Clock mode.

**㉒ SET/TRACKING/V. LOCK/FINE buttons (–/+)**
These are quadruple-function buttons.
- as SET buttons — press to set the correct data in the Clock Set or Timer Set mode.
- as TRACKING buttons — press both to cancel the automatic Digital Tracking mode, then press either for manual tracking control. (See page 10.)
- as V. LOCK buttons — press either to reduce vertical vibrations, if observed in the Still mode.
- as FINE tuning buttons — press to shift the frequency in either direction to fine-tune in a specific station in the Real Channel mode.

**㉓ SELECT/SUMMER TIME ADJUST button**
This is a dual-function button.
- as a SELECT button — press to select the item to be set in the Clock Set, Real Channel or Timer Set mode.
- as a SUMMER TIME ADJUST button — press and quickly release to advance the clock by one hour, hold it pressed for 2 seconds to set the clock back by one hour. (See page 7.)

**㉔ START button**
Press to engage the 24-Hour Instant Timer Set mode. (See page 15.)

**㉕ TIMER button**
Press to engage the Timer Standby mode.

## Rear Panel

**㉖ AUDIO/VIDEO socket**
A 21-pin standardised audio/video input/output socket for AV connection to a TV or a 2nd video recorder. The input from this socket can be recorded in the AUX mode engaged by obtaining "AU" in the channel display.

**㉗ VPS connector**
Connect the optional VPS for adapter decoding teletext programmes and for teletext timer programming.

**㉘ PAUSE terminal**
When using this recorder as the source player, connect to the PAUSE OUT terminal of a second VCR (if so-equipped) for synchronized preroll operation. This terminal can also be used for editing from a JVC VideoMovie camera/recorder using the Master Edit Control system.

**㉙ Aerial input connector (ANTENNA IN)**
Connect an aerial to this connector.

**㉚ Attenuator switch (ATT.)**
Set to OFF to receive broadcasts from distant stations. Set to ON to receive broadcasts of high field strength.

**㉛ TEST signal switch**
Set to ON when tuning your TV receiver for the video channel. A test signal in the form of two vertical white bars will be available.

**㉜ SYSTEM select switch**
Set this switch to match the broadcast system of your television receiver (G or K). If the colour TV broadcast system in your area is PAL B/G or SECAM B/G, set it to "G"; if the colour TV broadcast system in your area is PAL D/K or SECAM D/K, set it to "K".

**㉝ RF converter frequency adjustment screw (CH40–CH32)**
(See page 6.)

**㉞ RF OUT connector**
Connect to the aerial terminal of a TV receiver through the aerial cable (provided).

**㉟ Power cord**

## Remote Control Unit

**① TIMER button**
Press to engage the Timer Recording Standby mode.

**② OPERATE button**
Press to turn the recorder power on or off.

**③ PROGRAM button**
Press to programme the timer.

**④ C. RESET/CANCEL button**
- Press to reset the realtime counter reading to "0H 00M 00S".
- Press to cancel the preset programme in timer programming.

**⑤ SELECT button**
Press to select the item to be set in time programming.

**⑥ C. MEMORY/REPEAT button**
- Press to engage the Counter Memory mode, "M" will appear on the FDP and the tape will stop automatically at the counter reading of "0H 00M 00S" when rewinding or fast-forwarding.
- Press to enter the repeat command in timer programming.

**⑦ REW and FF (SHUTTLE SEARCH) buttons**

**⑧ SET (–/+)/ CHANNEL (∨/∧) buttons**
Press to set to the correct date in timer programming or to select a desired channel.

**⑨ REC button**
Press together with the PLAY button to start recording.

**⑩ PLAY button**

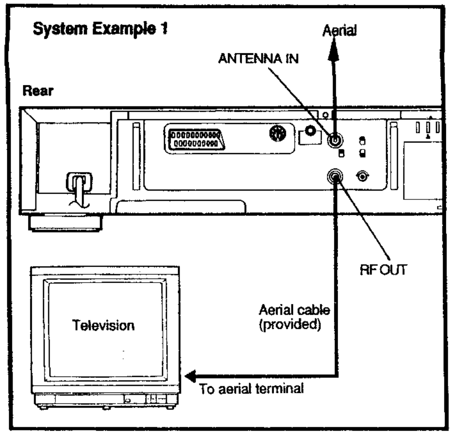
**⑪ STOP button**

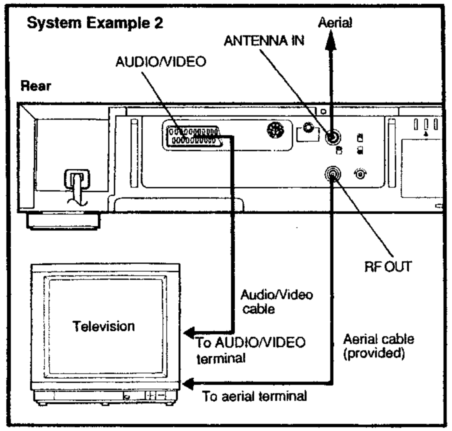
**⑫ PAUSE/STILL button**

**Operating distance for remote control unit**
- The maximum operating distance is about 8 m.

**Installing the batteries**
- Insert two "R6"-size batteries (provided) into the battery compartment on the rear of the remote control unit, observing correct polarity.

# CONNECTIONS





### AERIAL AND RF CONNECTION

1. Remove the aerial cable from the television and reconnect it to the recorder's ANTENNA IN connector. The recorder is then ready to record off-air programmes.
2. Connect the recorder's RF OUT connector to the television's aerial terminal using the provided aerial cable. The television is then ready to receive broadcast programmes. When you are not using the recorder, the TV signals are fed to the television via this terminal.
3. Set the SYSTEM select switch ⓬ to the appropriate position according to your TV system. (Refer to the chart below.)

| Switch position | Colour TV broadcast system | Major countries |
|---|---|---|
| G | PAL B/G | Austria, Denmark, Finland, Holland, Italy, Norway, Spain, Switzerland, Sweden, West Germany |
| | SECAM B/G | G.D.R. (East Germany) |
| K | PAL D/K | China, Mongolia |
| | SECAM D/K | Bulgaria, Czechoslovakia, Hungary, Poland, Rumania, U.S.S.R. |

- If your television is equipped with the aerial terminal only, you view tape programmes also via this terminal. In this case, set the television to UHF channel 36 (or a UHF channel adjusted as the video channel). See "VIDEO CHANNEL SETTING" below.

### AV CONNECTION

- If your television is equipped with a 21-pin SCART connector, connect the recorder's AUDIO/VIDEO socket to the television's SCART connector.
- To view tape programmes via this connector, set the television to the AV mode.

**Note:**
For switching the television's input mode, refer to the instruction manual of your television.

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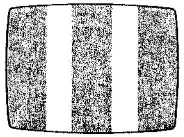
### VIDEO CHANNEL SETTING

1. Press the OPERATE button ⓫ to turn the power on. Turn on the TV receiver.
2. Set the TEST switch ⓭ to ON.
3. Adjust your TV receiver in the vicinity of UHF channel 36 until you bring in the two white signal bars on the screen as illustrated. This is your VIDEO CHANNEL.
4. Reset the TEST switch to OFF.

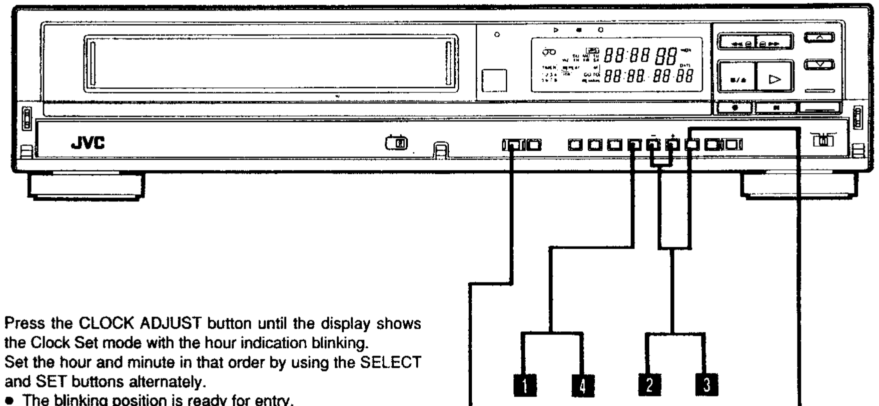


**Notes:**

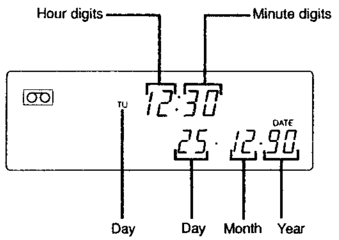
- If some interference noise is seen on the screen because of broadcasts on neighbouring channels or if your preset broadcasts should be affected in picture quality, it is necessary to shift the RF converter output frequency from that of channel 36. Consult your JVC dealer for making this adjustment.
- Video channel setting is also possible using a prerecorded VHS video cassette. Play back the tape and tune the TV receiver to obtain clear pictures and sound while monitoring the playback picture on the TV screen.
- If your TV receiver is not provided with an AFC circuit, perform fine tuning of the TV receiver when you are actually viewing video cassettes.
- Set the SYSTEM select switch ⓬ to the appropriate position.

# CLOCK SETTING

Plug the recorder into an AC outlet. The display shows a blinking 0:00.



1. Press the CLOCK ADJUST button until the display shows the Clock Set mode with the hour indication blinking.
2. Set the hour and minute in that order by using the SELECT and SET buttons alternately.
   - The blinking position is ready for entry.
   - Press SET until the correct indication appears in each position.
3. Set the day, month and year in the same way.
   - In year setting, set only the last two digits of the year.
4. Press CLOCK ADJUST.
   - Press it at the exact instant of the time signal, and the clock will be set accurately to the present time.
   - The day-of-the-week indication will be displayed automatically.



**Notes:**

- Clock setting is not possible in the timer recording standby mode. First check to see that the TIMER indicator on the FDP is not lit.
- Enter the data within 10 seconds after pressing the CLOCK ADJUST button.

### SUMMER TIME ADJUST

This convenient feature is for quickly making the annual clock adjustment to the "summer time" (daylight saving time) setting, and back to regular time later.

1. Simply press and quickly release the SUMMER TIME ADJUST button in the Clock Set mode to set the clock forward by one hour.
2. Later in the year, to switch back to regular time, simply hold the SUMMER TIME ADJUST button pressed for 2 seconds to set the clock back by an hour.

### DISPLAY OFF

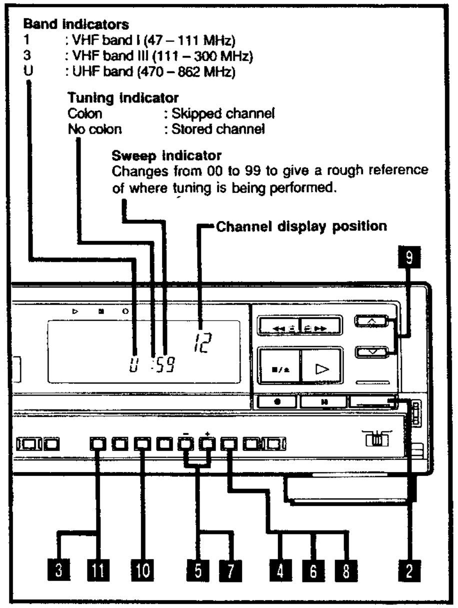
Press the DISPLAY OFF button to make all indications on the FDP disappear when they are not required; the display will show "-:--". Press again to make the clock display reappear.

**Power failure indicator**

The blinking 0:00 (initial condition of the display) is also a power failure indicator, showing that there has been a power failure exceeding about 60 minutes. Readjusting the time restores the normal condition of the clock display.

# OPERATING THE BUILT-IN TUNER

This recorder incorporates a voltage synthesized tuner with 48-channel preset capacity. Only channels stored can be called up with the TV PROG. buttons in modes other than Channel Set. In the Channel Set mode, all channel numbers including skipped ones are successively displayed so that they can be stored or skipped.


Band indicators
1 : VHF band I (47 – 111 MHz)
3 : VHF band III (111 – 300 MHz)
U : UHF band (470 – 862 MHz)
Tuning indicator
Colon : Skipped channel
No colon : Stored channel
Sweep indicator
Changes from 00 to 99 to give a rough reference of where tuning is being performed.
Channel display position
U :59
12
9
3
11
10
5
7
4
6
8
2

### Storing channels

1. Turn on the TV receiver and adjust it to your video channel.
2. Turn on the recorder.
3. Press CH. SET.
4. Press SELECT.
   - The band indicator will blink.
5. Press SET until the correct band indication appears.
6. Press SELECT.
7. Press SET until the desired broadcast signal is detected; use either the "–" or "+" button depending on the direction of search.
   - The sweep indicator will count down or up.
8. Press SELECT.
   - The channel position display will blink.
9. Press the TV PROG. buttons ∨ or ∧ to select the programme number you wish to use for the broadcast signal selected.
10. Press STORE. The "colon" will disappear.
    - Repeat steps 4 through 10 for all necessary channels.
11. Press CH. SET to disengage the Channel Set mode.
    - Stored channels will be called up during up/down scanning with the TV PROG. buttons.

### Skipping channels

1. Press TV PROG. to select the channel to be skipped.
2. Press CH. SET.
   - The band indicator and the sweep indicator corresponding to the broadcast stored in that channel will appear.
3. Press SKIP ⑱. The "colon" will appear.
4. Press CH. SET to disengage the Channel Set mode.
   - The skipped channel will not appear on the channel display during up/down scanning with the TV PROG. buttons.

**Available channels in each band**

| Band indicator | Frequency | Channels |
|---|---|---|
| 1 | VHF band I (47 – 111 MHz) | E2 – E4 (Common European channels)<br>S1 – S3, M1 (Belgium)<br>X, Y, Z, S1 (Switzerland)<br>R1 – R5 (Czechoslovakia, Hungary, Poland, U.S.S.R.) |
| 3 | VHF band III (111 – 300 MHz) | M2 – M10 (Belgium)<br>S2 – S10 (West Germany, Switzerland)<br>E5 – E12 (Common European channels)<br>U1 – U10 (Belgium)<br>S11 – S20 (West Germany, Switzerland)<br>R6 – R12 (Czechoslovakia, Hungary, Poland, U.S.S.R.) |
| U | UHF band (470 – 862 MHz) | E21 – E69 (Common European channels)<br>R21 – R69 (Czechoslovakia, Hungary, Poland, U.S.S.R.) |

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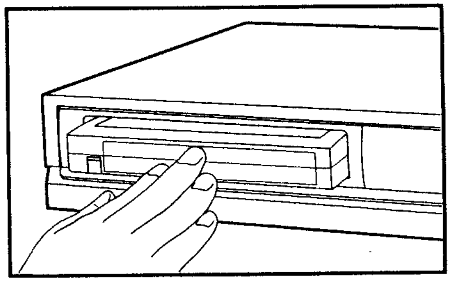
# LOADING AND UNLOADING A CASSETTE

**Motorized Loading System**
- The cassette can be loaded even when the power has not been turned on. Inserting a cassette into the loading slot turns the power on automatically.
- The cassette can be unloaded even when the power has been turned off. If a cassette is inside, pressing the EJECT button turns the power on automatically and, after ejection of the cassette, shuts it off automatically.

**Auto-Play System**
- Inserting a cassette, with its safety tab removed, turns the recorder on and playback of the cassette begins automatically.

## LOADING

Insert a cassette as illustrated with its labelled side facing you.
- With a cassette inserted, the"[oo]" indicator appears on the FDP.
- The counter resets automatically when a cassette is inserted.



**Notes:**
- Be sure to insert the cassette firmly into the slot; otherwise it will be automatically ejected.
- The automatic loading mechanism will operate only when the cassette is inserted correctly.

## UNLOADING

Press the STOP/EJECT button ⑦in the Stop mode.

**Caution**
- If unloading of a cassette is not possible, check to see whether the TIMER indicator is lit. If so, press the TIMER button so the TIMER indicator extinguishes.
- Do not attempt to pull out the cassette once automatic loading has started.

**WARNING**
- Do not insert fingers or any foreign object beyond the door flap of the cassette loading slot, as this could lead to injury or damage to the mechanism. Show special caution with children.

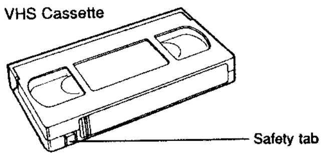
### USABLE CASSETTES AND THEIR RECORDING TIME

Both regular VHS and S-VHS cassettes can be used with this video recorder for recording. However, only regular VHS recordings can be made and played back on this video recorder. S-VHS recordings can neither be made nor played back on this video recorder.

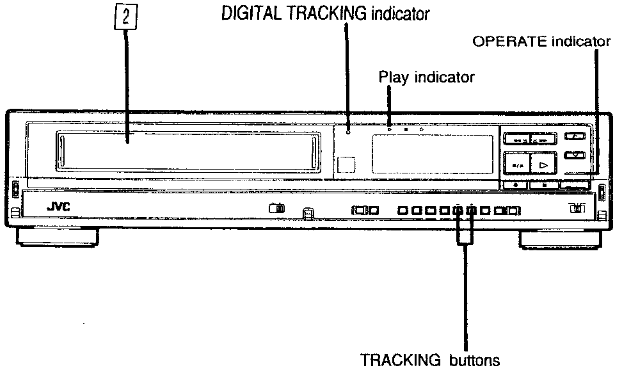
| Type of Cassette | Recording/Playback Time |
|---|---|
| E-30 | 30 minutes |
| E-60 | 1 hour |
| E-90 | 1 hour, 30 minutes |
| E-120 | 2 hours |
| E-180 | 3 hours |
| E-240 | 4 hours |

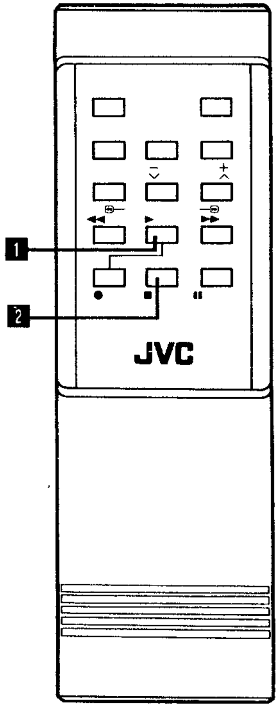
### ACCIDENTAL ERASURE PREVENTION

- Video cassettes are equipped with a safety tab to prevent accidental erasure. When the tab is removed, recording cannot be performed. If you wish to record on a cassette whose tab has already been removed, use adhesive tape to block the hole.



## PLAYING BACK A VIDEO CASSETTE





### PREPARATION

1 Switch on the TV receiver.
- Set the TV receiver to your video channel or to the AV mode (depending on the connection).

2 Load a pre-recorded cassette.
- Power will be switched on automatically.
- When a cassette with its safety tab removed is loaded, playback starts automatically.

### DIGITAL TRACKING SYSTEM

This recorder incorporates a digital tracking system for automatic tracking adjustment. In most cases you do not have to adjust the tracking.

- When you start playback after inserting a tape, the digital tracking system automatically adjusts the tape path relative to the heads to obtain the best possible pictures.
- This automatic tracking adjustment also takes place when the playback output level reduces below a certain level.
- The DIGITAL TRACKING indicator blinks while the system is searching for optimum tracking, and remains lit as long as the automatic tracking mode continues.

If automatic tracking fails, and some noise bars are visible on the screen, use the manual tracking mode.

- Press both TRACKING buttons simultaneously to cancel the automatic mode, then press either button to move noise bars out of the screen.
- To return to the automatic mode, press both buttons simultaneously.

### OPERATING PROCEDURE

**1** Press the ► button.

**2** Press the ■ button at the end of the programme.

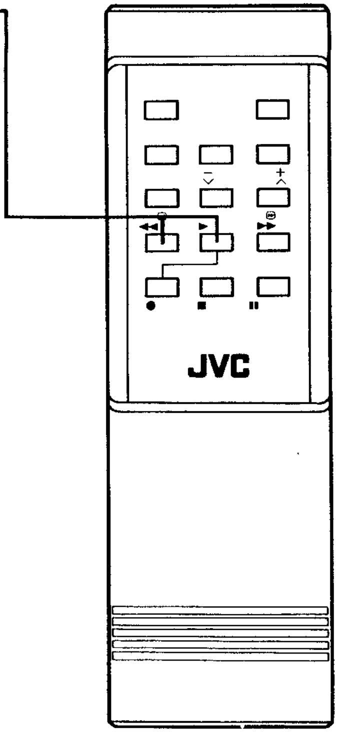
**Notes:**
- For various convenience facilities and special-effects features available during playback, see the next two pages.
- The tape-end auto-rewind mechanism functions in the Play, Fast Forward and Forward Search modes.

## CONVENIENT FACILITIES RELATED TO PLAYBACK

### MEMORY PLAY

If you want to watch the tape from its beginning after rewinding, you do not have to wait for completion of rewind to press the ► button.

- Press the ◄◄ button and then ► button within 2 seconds. Playback will start automatically at the beginning of the tape. (Check to see that the counter memory indicator M is off).
  If you want to watch the tape from the counter reading of "0H 00M 00S", press the C. MEMORY button to obtain M. Then, press the ◄◄ (or ►►) button and then ►.
- While the tape is being rewound, the Play (▷) indicator is blinking. To cancel the Memory Play mode and go to another mode, press the corresponding button (■, ►, ►►, ◄◄).

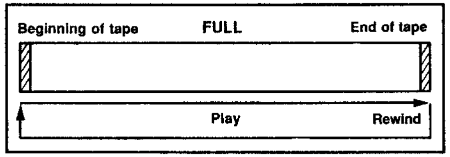


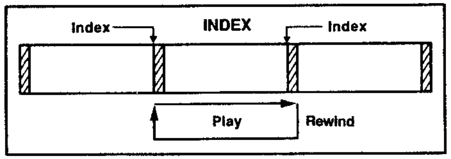
### MEMORY POWER OFF

If you are going to turn the power off after rewinding the tape, press the OPERATE button within 2 seconds after pressing the ◄◄ button.

### REPEAT PLAYBACK — FULL REPEAT OR INDEX REPEAT

This function allows you to set the video recorder for repeated playback (5 times) of the entire tape ("FULL REPEAT") or repeated playback (5 times) of a segment of the tape from one index mark to the next ("INDEX REPEAT"). An index mark is recorded automatically on the tape at the beginning of each recording.

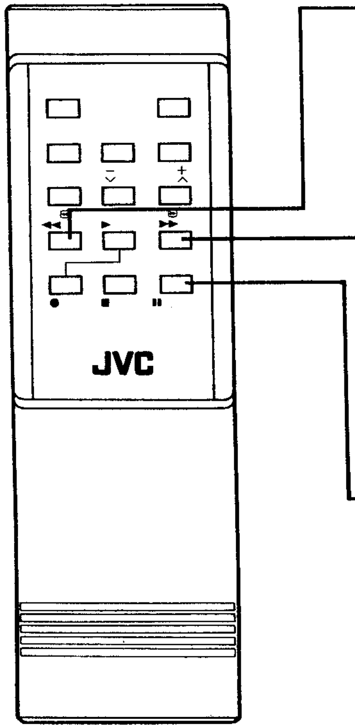




- Set the REPEAT switch ⓭ as required.
  With the switch in the INDEX REPEAT position, when the tape reaches the nearest index mark during playback, it rewinds to the previous index mark and playback is repeated between these two index marks.

**Note:**
After repeat playback, be sure to reset the REPEAT switch to "OFF".

# SPECIAL-EFFECTS PLAYBACK



### HIGH-SPEED REVERSE SEARCH

**◄◄ button**

- To rewind the tape, press this button in the Stop mode.
- To shuttle search the tape in the reverse direction, press this button in the Play mode.
- The shuttling speed is about 9 times normal.
- Press the ► button to return to normal playback.
- For briefer scanning, keep the ◄◄ button pressed for more than 2 seconds; when you release the button, the Search mode will be cancelled.

### HIGH-SPEED FORWARD SEARCH

**►► button**

- To fast forward the tape, press this button in the Stop mode.
- To shuttle search the tape in the forward direction, press this button in the Play mode.
- The shuttling speed is about 9 times normal.
- Press the ► button to return to normal playback.
- For briefer scanning, keep the button pressed for more than 2 seconds; when you release the ►► button, the Search mode will be cancelled.

### STILL PLAYBACK, FRAME ADVANCE AND SLOW MOTION

**II button**

- To view a still picture, press this button in the Play mode.
- To advance the picture frame by frame, press this button again.
- To obtain slow-motion playback, keep this button pressed for more than 2 seconds.
- To return to the Still mode, press this button again.
- To return to normal playback, press the ► button.
- When the Still mode continues for longer than about 5 minutes, the Stop mode will be entered automatically.

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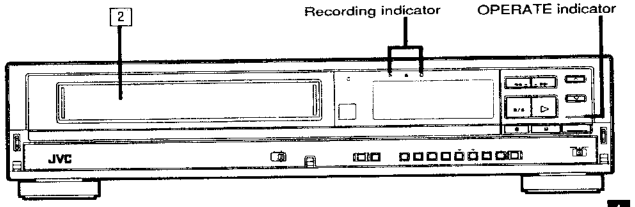
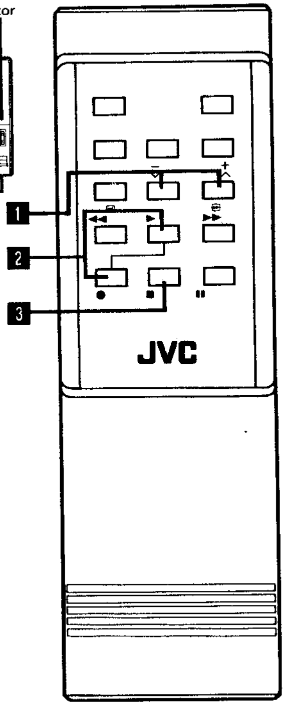
**Notes:**

- With some televisions, the still picture may be unstable. If vertical vibration of the picture is observed, attempt to correct it by pressing the V.LOCK buttons.
- If noise bars are visible in the Still, Slow, or Frame-by-Frame mode, attempt to correct it in the manual tracking mode as described on page 10.
- No audio is available during any special-effects playback mode.

# RECORDING TV PROGRAMMES





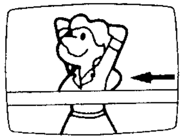
## PREPARATION

1. Switch on the TV receiver.
   - Set the TV receiver to your video channel , or to the AV mode (depending on the connection).
2. Load a cassette (with safety tab in place). Power will be switched on automatically.

## OPERATING PROCEDURE

1. Select the channel you wish to record with the TV PROG. ∨/∧ buttons.
2. Press the ● and ► buttons simultaneously to start recording. "INDX" will appear on the FDP and blink to show that an index code is being recorded.
   (When using the video recorder's front panel control buttons, press REC/ITR once to start recording.)
   - If there is part of the programme you do not want to record, press the II button. A white horizontal bar will appear on the screen, which reduces in size in 4 steps as time elapses. When the last quarter starts blinking and disappears, the Stop mode will be entered automatically. The pause duration is possible for about 5 minutes:
   - To continue recording from the Pause mode, press the ► button while the white bar is on-screen.
3. Press the ■ button at the end of the programme.

**PAUSE MODE INDICATOR**



### RECORDING ONE TV PROGRAMME WHILE WATCHING ANOTHER

A programme not being viewed can be recorded while you enjoy viewing another programme.
This permits the recorded programme to be played back later at your convenience.

The key points to remember are:

- Select the channel you wish to record with the recorder's channel selector.
- Select the channel you wish to view with the TV receiver's channel selector.

---

**Notes:**

- If the REC/ITR button is pressed more than once, the Instant Timer Recording mode will be entered (see page 15). To return to ordinary recording, repeatedly press the REC/ITR button until the ITR indicator on the FDP extinguishes.
- When recording is restarted from the Record-Pause mode, assemble recording is performed so that the playback picture will not distort at the edit point. A few frames recorded before the pause may be erased due to overlap of the new recording. This is not due to any defect of the unit.
- If the ● button cannot be engaged, check to see if the cassette safety tab has been removed. (See page 9).
- When the end of the tape is reached during recording, the tape is automatically rewound to the beginning and stops.
- The built-in tuner's automatic channel lock mechanism prevents the selected channel from being altered during recording. Therefore, if you wish to change the channel during recording, first engage the Record-Pause mode and then select a different channel.

# CONVENIENT FACILITIES RELATED TO RECORDING

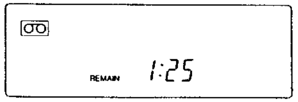
## REALTIME TAPE COUNTER

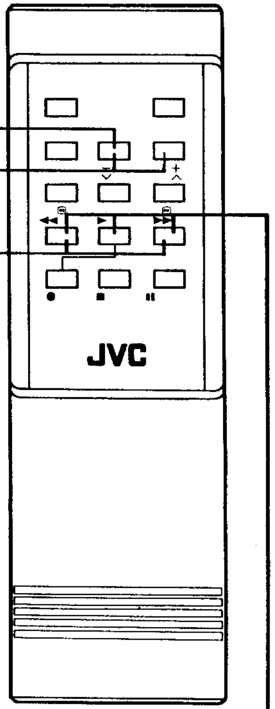
Unlike usual tape counters which show tape locations in numbers, this realtime tape counter shows tape time precisely in hours, minutes and seconds in all modes. The counter resets automatically when a cassette is inserted.

## ELAPSED RECORDING TIME INDICATION

When you need to know the exact time of a recording, press the C. RESET button before starting recording or playback. The counter will be reset to "0H 00M 00S" and show the exact elapsed time as the tape runs.

**Note:**
- The indicated remaining time is approximate.





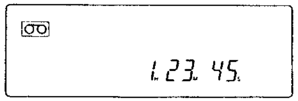
## COUNTER MEMORY FUNCTION

1. Press the C. RESET button at a point which you may wish to locate later.
   - The counter will read "0H 00M 00S".
2. Press the C. MEMORY button. M will appear on the FDP.
3. Press the ◄◄ (or ►►) button when you need to return to the designated point.
   - The tape will rewind (or fast forward) and stop at about "0H 00M 00S" automatically.
   - The Counter Memory function can also be used in conjunction with the Memory Play function (page 11).

## REMAINING TAPE TIME INDICATION

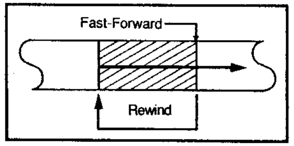
The tape counter can be switched to display the remaining tape time.

- Press the DISPLAY button ⑰ to obtain the REMAIN tape time indication in hours and minutes on the FDP.



## RETAKE FUNCTION

While in the Record-Pause mode, pressing the ►► or ◄◄ button initiates normal-speed search in the corresponding direction. Releasing the button engages the Record-Pause mode. If you have recorded unnecessary material because of having engaged the Record-Pause mode too late, use this function to return to the position where you want the next recording to start. Then, simply press the ► button when you want to re-start recording.



**Note:**
- Rainbow noise may occur in the rewound and re-recorded section.

# INSTANT TIMER RECORDING

## 24-HOUR TIMER

The 24-Hour Timer Recording feature allows unattended automatic starting and stopping of the recording of a single programme which starts within a 24-hour period.

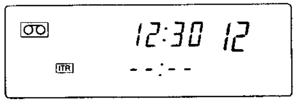
**Preparation**

1. Insert a cassette with its safety tab in place. The recorder turns on automatically.
2. Select the channel you wish to record from.

**Setting the timer**

1. Press the START button ㉙ to engage the 24-Hour Instant Timer Set mode. The following appears on the FDP with the current time.

**FDP**



   - Each pressing delays the START time by 30 minutes
   - For a more precise time setting, use the SELECT and SET buttons.
2. After reaching the desired START time, press the REC/ITR button the required number of times to set the desired length of recording time.
   - For a more precise time setting, use the SELECT and SET buttons.
3. After confirming the START time and recording length, press the OPERATE button.
   - "ITR" remains on the FDP and the 24-Hour Instant Timer Standby mode will automatically engaged.
   - If the programme has not been correctly preset, the "ITR" indicator will blink for about 10 seconds when the OPERATE button is pressed. Recheck the programmed data.

**Notes:**
- At each step of the timer setting procedure, if no data is entered within 10 seconds, the 24-Hour Timer Set mode is cancelled, and the current time is displayed.
- To cancel the 24-Hour Timer Set mode, press the CANCEL button once or twice depending on the setting status.
- 24-Hour Timer Recording has priority over other timer programme settings; therefore, no other programmes, set for timer recording, will be recorded until 24-Hour Timer Recording has been executed.

---

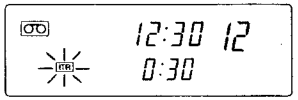
## OFF-TIMER

- Start recording as described on page 13.

After you start recording, the recorder can be set to stop automatically after a certain period of time. Use this facility for starting a recording before you go to bed or leave home.

1. Press the REC/ITR button while recording (or twice if in the Stop mode).
   - The following indication will appear on the FDP, to show that the recorder is recording in the Instant Timer Recording mode and power will switch off after 30 minutes.

**FDP**



2. Each time the REC/ITR button is pressed, recording time increases by 30 minutes to a maximum of 4 hours. If the REC/ITR button is pressed again, the Normal Recording mode will be entered.
   - For a more precise time setting, use the SELECT and SET buttons to set to the exact time required (possible up to 4 hours and 59 minutes).

**Notes:**
- While recording is in progress, the displayed time counts down; when 0:00 is reached, the Record mode is released after 10 seconds and the power is switched off.
- If you want to stop recording after having started recording in the Instant Timer Record mode, press the STOP/EJECT button.
- If instant timer recording is engaged while the unit is in the Pause mode, the timer will count down normally, but recording will not begin until the PLAY button is pressed.
- When the Instant Timer Record-Pause mode continues for longer than 5 minutes, the mode is released and power is switched off.
- If you want to check the elapsed time (Realtime Counter reading) on the FDP while performing Instant Timer Recording, press the DISPLAY button to obtain the desired indication. After about 5 seconds, the indicator will return to the ITR mode and the remaining time indication will reappear automatically.

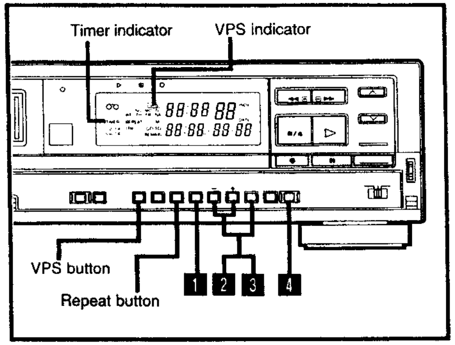
# AUTOMATIC TIMER RECORDING

First of all, load a cassette (with safety tab in place); power will be switched on automatically.

**Two ways to perform timer programming**

A. **Local programming:** Programme the timer using the recorder's controls while referring to the recorder's FDP.

B. **Direct remote programming:** Programme the timer using the remote control's buttons while referring to the recorder's FDP.



## A. Local Programming

**1** Press PROGRAM button ㉑.

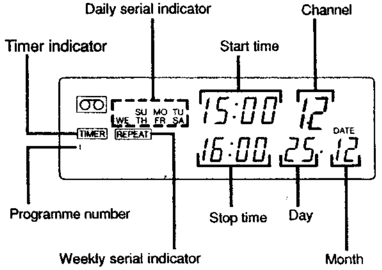
- The display will change to the Timer Set mode for programme number "1". To advance to programme number 2 – 8, press either SET button ㉒ a required number of times.

**2** Set the start time by using the SELECT button ㉓ and the SET buttons alternately.

- Select the item to be set with the SELECT button; the selected item will blink.
- Set the desired data with the SET –/+ buttons.
- To record a weekly serial, press the REPEAT, button ⑳ once.
- To record a daily serial starting on a certain day, press REPEAT twice.

**3** Set the stop time, date and channel in succession in the same way as for setting the start time.

- To record a daily serial starting on the day of setting, there is no need to enter any date figure; simply advance to the next item.
- When not using the VPS recording system with the VPS adapter connected, before setting the channel, press the VPS button to make "VPS" disappear.
- For programming the timer to record an external source, while the channel position is blinking, press SET –/+ until the "AU" indicator appears in the channel display section on the FDP.

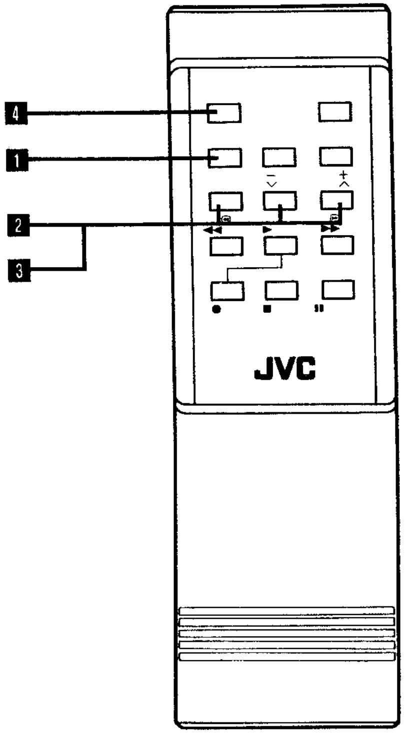


**4** After making sure that the cassette is loaded, press the TIMER button ㉕.

- The Timer Recording Standby mode will be engaged with the TIMER indicator and the preset programme number(s) illuminated and the power turned off.
- With no cassette loaded, the TIMER and "cassette loaded" indicators will continue blinking.
- A cassette whose safety tab has been removed will be ejected automatically.
- If a preset programme contains errors, the programme number will not illuminate. Recheck the programmed data.

## B. Direct Remote Programming

Following the procedures above, use the remote control's buttons instead of the recorder's with the remote control directed toward the recorder's infrared beam receiving window ❸.



### Setting the date, start and stop times, and channel

- It is not possible to set the date, start and stop times unless the date and clock have previously been set.
- Enter the data while the digits are blinking.
- The stop time can be set within 24 hours of the start time.
- Non-applicable numbers (such as January 32, February 30 for dates, 24 or larger for hours, 60 or larger for minutes and 49 or larger for channels) will be rejected when keyed in.

### Cancelling the preset data

- The preset programmes can be cancelled. First disengage the Timer Standby mode and engage the Timer Set mode for the programme number you wish to cancel and then press the CANCEL button ⑲ or ④.
- An executed programme is automatically cleared.

### Timer recording operation

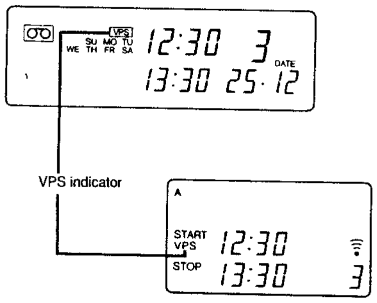
- When the preset start time is reached, recording starts.
- After timer recording, the power is switched off. If the end of the tape is reached during timer recording, the cassette is automatically ejected and then the power is switched off.

## VPS RECORDING

VPS (Video Programme System) is a broadcast system employed by TV stations in certain countries. In the VPS system, TV stations transmit different VPS codes for different TV programmes, which control the starting and stopping of the video recorder and have precedence over times preset in the timer for accurate recording of a particular programme from start to finish. For using this function, an optional adapter, the VPS adapter must be connected to the rear panel of the recorder.

1. Press the PROGRAM button ㉑.
2. Set the date, start time, stop time and channel in the same way as for timer programming.
3. Press the VPS button ⓯.
   - All timer data will be converted to VPS codes and stored in memory.
4. Press the TIMER button ㉖ or ①.
   - The recorder will enter the VPS Standby mode at 20:00 on the day previous to the preset day and remain engaged until 3:59 on the following day, if the intended programme has not yet been broadcast.
   - When a VPS code corresponding to the intended TV programme is detected during the VPS Standby mode, recording will start. When the VPS code changes to another, recording will stop.
   - When an interruption code is detected during VPS recording, the VPS standby mode is engaged and recording restarts when the regular VPS code is restored.

**Note:**
- Operation at the end of VPS recording is the same as with ordinary timer recording.



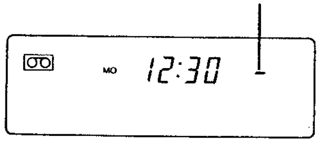
## CHILD LOCK FUNCTION

The Child Lock function is for preventing accidental operation by young children, or other unwanted operation, such as playing back or recording over an important cassette you may have left inserted in the recorder. By engaging the Child Lock mode, the operation buttons on the recorder become ineffective, unless the remote control is used.

### To engage the Child Lock mode

- Press the remote control's OPERATE button ② to turn the recorder power off and keep this button pressed for about 2 seconds after the power LED indicator has gone off.
- The Child Lock indicator (–) will appear in the channel display section on the FDP to show that the recorder is now in the Child Lock mode.

Child lock indicator



### To disengage the Child Lock mode

- When the remote control's OPERATE button is pressed to turn the recorder power on, this disengages the Child Lock mode. The recorder will turn on and the corresponding display will appear with the channel number appearing where the child lock indicator appeared before.
- Pressing the TIMER button during timer recording also disengages the Child Lock mode.

**Notes:**
- While in the Child Lock mode, the recorder can receive timer programmed data from the remote control.
- Timer recording is possible also, even while in the Child Lock mode. After timer recording has been performed, the Child Lock mode remains in effect.
- Even after automatic cassette ejection at tape end, following timer recording, the Child Lock mode remains in effect.
- It is possible to insert a cassette while in the Child Lock mode. After inserting a cassette, the Child Lock mode remains in effect.

## RECORDING FROM AN EXTERNAL SOURCE

By connecting an external video source (such as a 2nd video recorder, VideoMovie camera-recorder, etc.) to the AUDIO/VIDEO socket, tape-to-tape transfer is possible.
- For connection of these units an appropriate cable is necessary.

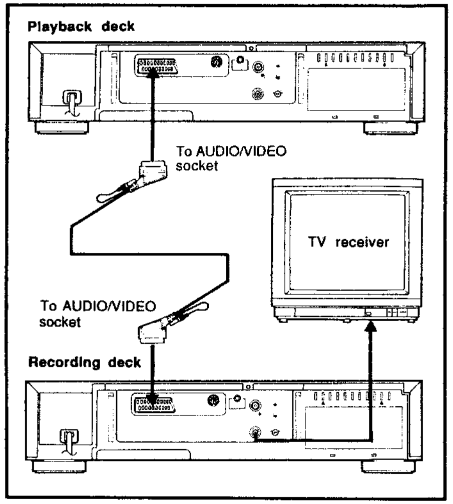
### Connection

1. Connect the AUDIO/VIDEO socket to the appropriate audio/video output of the 2nd video recorder.
2. Connect a TV receiver to the recorder to monitor the picture while recording.

### Operation

1. Turn the power on for all connected equipment.
2. Tune the TV receiver to your video channel.
3. Load a cassette with its safety tab in place.
4. Press either TV PROG. button ❿ to obtain "AU" in the channel display section on the FDP.
5. Press the REC/ITR button ❻ and the PAUSE/STILL/SLOW button ⓮ to put the recorder in the Record-Pause mode.
6. Play back a tape on the source equipment to determine the segment to be recorded.
7. Press the PLAY button ❾ to start recording.
8. To stop recording temporarily, press the PAUSE/STILL/SLOW button.
9. To end recording, press the STOP/EJECT button ❼.

**Note:**
- For the operation of the source equipment, refer to the instruction manual of the relevant machine.



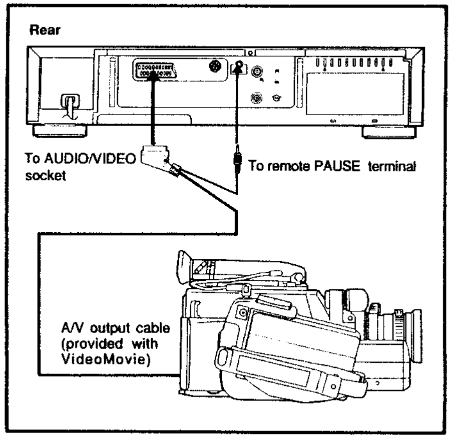
### EDITING TO ANOTHER VIDEO RECORDER

This video recorder can also be used as the source player when editing tapes. This video recorder's remote PAUSE terminal is designed to accept a preroll command when used as a source player with a video deck which is preroll-capable and equipped with a Pause Control Output terminal. This combination makes possible synchronized preroll editing for high-quality editing results.

### EDITING FROM A VIDEOMOVIE

- Connect the VideoMovie's AV OUT connector to the video recorder's AUDIO/VIDEO socket.
- Connect the mini-plug of the AV output cable to the remote PAUSE terminal of the video recorder.
- When the recorder is connected to a VideoMovie which incorporates a Master Edit Control system*, you can control the recorder with the VideoMovie's controls for making edits free of transition-point gaps and distortion. Refer to the VideoMovie's instruction manual for detailed operating procedures for editing.
- With this connection, you can also use the VideoMovie as a video camera for direct recording onto the recorder's tape. Put the recorder in the Record-Pause mode and operate the VideoMovie's start/stop trigger to start and pause recording. (For direct recording with a separate video camera, a camera adapter is necessary.)

*JVC dedicated models only.



# IN CASE OF DIFFICULTY

**What may initially appear to be trouble is not always a real problem. Make sure first ...**

### POWER AND TAPE TRANSPORT PROBLEMS

| Symptoms | Check points |
|---|---|
| No power is applied to the recorder. | • Is the power cord disconnected?<br>— Connect it. |
| Clock is functioning properly, but the recorder cannot be powered. | • Is the TIMER indicator lit on the FDP?<br>— Press TIMER to disengage the Timer Recording Standby mode. |
| Tape does not run during recording. | • Is the PAUSE/STILL/SLOW button engaged?<br>— Press the PLAY button. |
| Tape stops in the Rewind or Fast-Forward mode. | • Is the COUNTER MEMORY switch set so that "M" appears on the FDP?<br>— Press to make "M" disappear. |
| Tape will not rewind or fast forward. | • Is the tape already fully rewound or fast forwarded?<br>— Check the cassette. |

### RECORDING PROBLEMS

| Symptoms | Check points |
|---|---|
| Recording cannot be started. | • Is a cassette loaded?<br>• Is the safety tab on the cassette removed?<br>— Reseal the slot with cellophane tape. |
| Camera recording is not possible. | • Are the camera and the camera adapter correctly connected?<br>• Is the power switch of the camera adapter set to ON?<br>• Does the channel display indicate "AU"?<br>— Press TV PROG. until "AU" appears in the channel display. |
| Timer recording is not possible. | • Have you set the clock correctly and programmed the timer correctly?<br>— Check once again.<br>• Is the TIMER indicator lit on the FDP?<br>— Press TIMER. |

### PLAYBACK PROBLEMS

| Symptoms | Check points |
|---|---|
| Playback picture does not appear while the tape is running | • Is the TV receiver's channel selector set to the correct video channel?<br>— Set it to the RF converter channel. (See page 6.)<br>• If you are using AV connection, is the television engaged in the AV mode?<br>— Operate the television's mode. |
| Playback is repeated. | • Is the REPEAT switch set to either "FULL REPEAT" or "INDEX REPEAT"?<br>— Set it to "OFF". |
| Noise appears during playback. | • Is the automatic tracking mode engaged?<br>— Engage the manual tracking mode. (See page 10.) |
| Playback picture is blurred or interrupted while TV broadcasts are clear. | • Video heads may be dirty.<br>— Head cleaning is necessary. Consult your JVC dealer. |
| Picture is normal but no sound. | • Is the SYSTEM select switch set to the appropriate position?<br>— Set to G or K depending on the system of your television receiver. |

### OTHERS

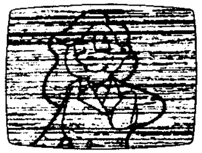
| Symptoms | Check points |
|---|---|
| Whistling or howling is heard from TV. | • Move camera or microphone away from TV or reduce TV sound volume. |
| Some channels are skipped over when selecting a channel. | • Those channels are preset to be skipped over. If you need them, restore them. |
| Channel cannot be switched. | • Is recording in progress?<br>— Press PAUSE/STILL/SLOW, select a desired channel and press PLAY . |
| The recorder cannot be operated with the remote control. | • Batteries are discharged.<br>— Replace with new one. |

This recorder contains microcomputers. External electronic noise or interference could cause malfunctioning. In such cases, switch the power off and unplug the power cord. Then plug it in again and switch on. Take out the cassette. After checking the cassette, operate the unit as usual.

# HEAD CLEANING

- Picture playback may become blurred or interrupted while the TV programme received is clear. This does not mean that the recorded programme has been erased.
- Dirt accumulated on the video heads after long periods of use causes such problems. In this case, head cleaning requiring highly technical care is necessary.

For head cleaning, consult the nearest JVC dealer.



# SPECIFICATIONS

## GENERAL

Power requirement : AC 220 V∿, 50/60 Hz
Power consumption : 22 W
Temperature : 5°C to 40°C (Operating)
: −20°C to 60°C (Storage)
Operating position : Horizontal only
Dimensions (WxHxD) : 435 x 94 x 322 mm
Weight : 5.3 kg
Format : VHS PAL standard
Tape width : 12.65 mm
Tape speed : 23.39 mm/sec
Maximum recording time : 240 min. with E-240 video cassette

## VIDEO

Signal system : PAL colour and CCIR monochrome signals, 625 lines/50 fields (See "WARNING")
Recording system : Rotary, slant azimuth two-head helical scan system
Input : 0.5 to 2.0 Vp-p, 75 ohms, unbalanced
Output : 1.0 Vp-p, 75 ohms, unbalanced
Signal-to-noise ratio : 43 dB (Rohde & Schwarz noise meter)
Horizontal resolution : 250 lines

## AUDIO

Recording system : Longitudinal track
Input : −3.8 dBs, (CENELEC standard), more than 50 k-ohms, unbalanced
Output : −3.8 dBs, (CENELEC standard), less than 1 k-ohm, unbalanced (100 k-ohms, load)
Frequency range : 70 Hz to 10,000 Hz

## TUNER

Tuning system : Voltage synthesized tuner
TV channel storage capacity : 48 positions (+ AUX position "AU")
Channel coverage : VHF 47 — 111 MHz
111 — 300 MHz
UHF 470 — 862 MHz
Aerial output : UHF channel 36 (adjustable 32 — 40)

## TIMER

Clock reference : Quartz-crystal
Programme capacity : 1-year/8-programme timer
Memory back-up time : 60 min.

## ACCESSORIES

Provided accessories : Aerial cable,
Infrared remote control unit,
"R6" battery x 2,
Video cassette tape
Optional accessory : VPS adapter VU-V110E

*Design and specifications subject to change without notice.*

## WARNING

1. In addition to PAL B/G and PAL D/K colour television signals, this recorder can also receive SECAM B/G and SECAM D/K colour television signals. SECAM B/G and SECAM D/K colour television signals can be recorded and played back in colour as far as this same recorder is used for recording and playback.
2. SECAM B/G and SECAM D/K colour television signals recorded on this recorder produce monochrome pictures if played back on another PAL or SECAM recorder.
3. SECAM B/G and SECAM D/K colour television signals recorded on another PAL or SECAM recorder produce monochrome pictures if played back on this recorder.
4. This recorder cannot be used in France. Use in France a recorder which is capable of receiving SECAM L colour television signals.
5. SECAM L prerecorded cassettes or recordings made with a SECAM L video recorder produce monochrome pictures when played back on this recorder.

# SECTION 1
# DISASSEMBLY AND MECHANISM ADJUSTMENTS

## 1.1 DISASSEMBLY

### 1.1.1 Top cover

1. Refer to Fig. 1-1-1 and set for the EJECT (Stop) mode and disconnect VCR from AC power.
2. Take out 4 screws Ⓐ and 1 screw Ⓑ. To remove the top cover, slide it in the direction of the arrow and lift it away.

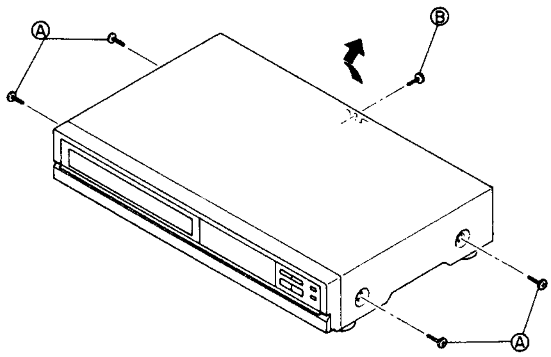


Fig. 1-1-1

### 1.1.2 Front panel assembly

1. Remove the top cover.
2. Carefully disengage 3 tabs Ⓒ of the front panel assembly from the upper side of the chassis.
3. Refer to Fig. 1-1-2 and pull the front panel assembly forward you to disengage 3 tabs Ⓓ of the front panel assembly from the bottom side of the chassis, then remove the front panel assembly.

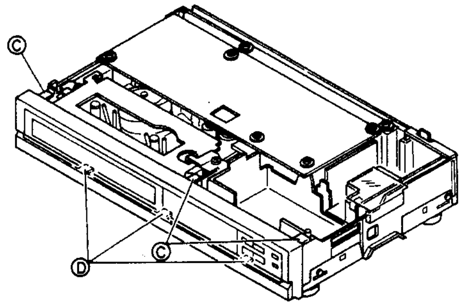


Fig. 1-1-2

### 1.1.3 Bottom cover

1. Remove the top cover.
2. Refer to Fig. 1-1-3 and take out 4 screws Ⓔ and 2 screws Ⓕ from the bottom of the chassis.
3. Disengage the bottom cover from 4 claws Ⓖ on the bottom of the chassis.

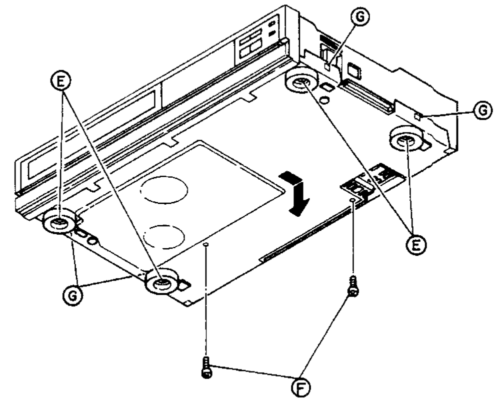


Fig. 1-1-3

### 1.1.4 Main board assembly

1. Remove the top cover.
2. Refer to Fig. 1-1-4 and take out 5 screws Ⓗ and 1 screw Ⓘ from main board assembly.

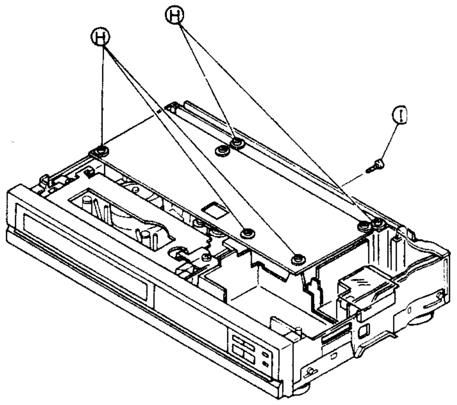


Fig. 1-1-4

### 1.1.5 Cassette housing

1. Remove the top cover and main board assembly.
2. Refer to Figs. 1-1-5 and 1-1-6.
   Take out 4 screws Ⓙ that secure the cassette housing. Disengage 3 tabs Ⓚ of the front panel and pull the front panel forward where it does not interfere with removing the cassette housing.
   Take out 2 screws Ⓟ and remove the drum shield cover.
   Remove the cassette housing in the upward direction.

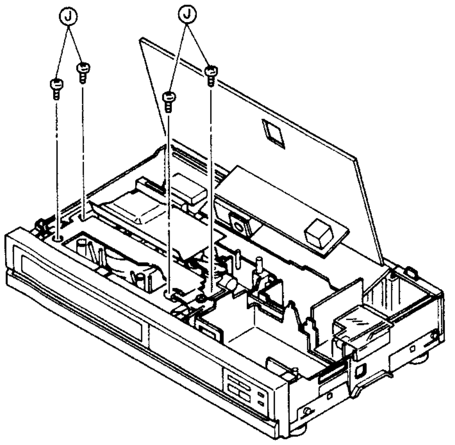


Fig. 1-1-5

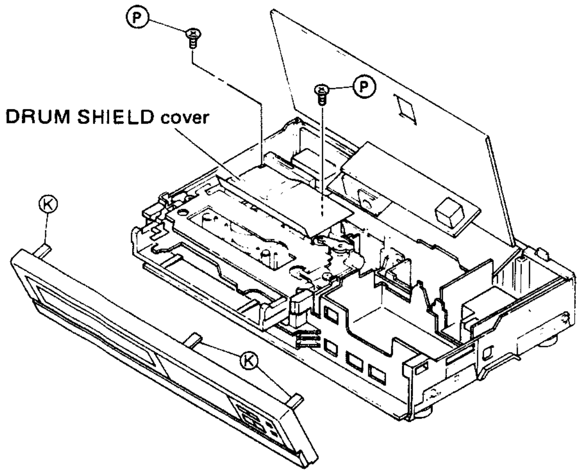

Ⓟ
Ⓟ
DRUM SHIELD cover
Ⓚ
Ⓚ

Fig. 1-1-6

### 1.1.6 Cassette housing installation

1. On the main deck, observe the positional relationships of the parts indicated in Fig. 1-1-7.
   If necessary, turn the loading motor by hand to obtain these positions.

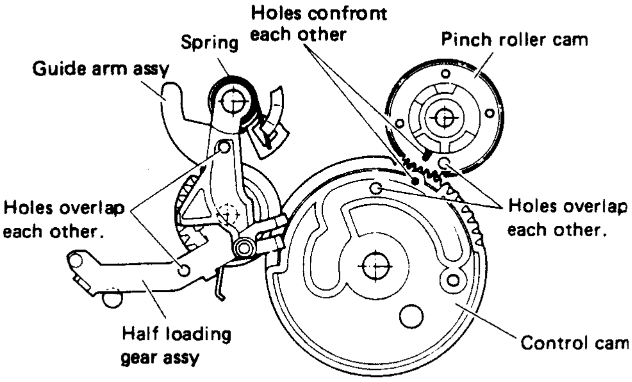

Holes confront each other
Spring
Pinch roller cam
Guide arm assy
Holes overlap each other.
Holes overlap each other.
Half loading gear assy
Control cam

Fig. 1-1-7

2. Refer to Fig. 1-1-8 and confirm that the clutch is engaged.
   If necessary, press the lever indicated by the arrow to where the clutch is locked.

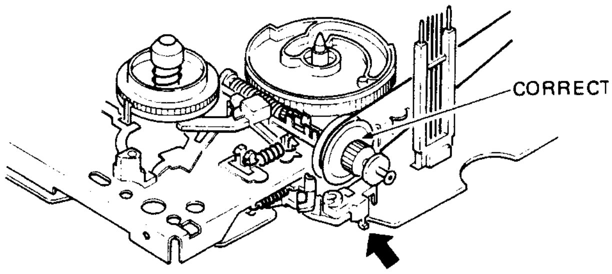


Fig. 1-1-8

3. Check that the cassette housing is in the eject state (internal holder of the cassette housing is locked in raised position).
   Set the cassette housing into place and secure with 4 screws.
4. Install the front panel as shown in Fig. 1-1-9 and re-engage the tabs. Supply power and use a spare cassette to check for normal loading and eject operations.

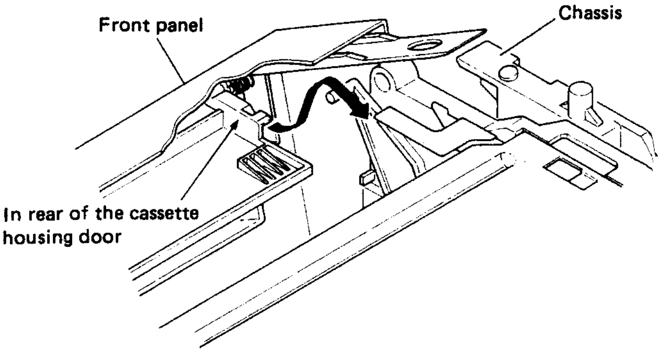

Front panel
Chassis
In rear of the cassette housing door

Fig. 1-1-9

5. Disconnect VCR from power, then reinstall the main board assembly and top cover.

### 1.1.7 Cassette housing door

1. Remove the top cover and front panel assembly.
2. Take out one screw Ⓛ of the front panel assembly.
3. Refer to Fig. 1-1-10 and use care regarding the torsion spring, then pull out the left end of the cassette housing door to move it.

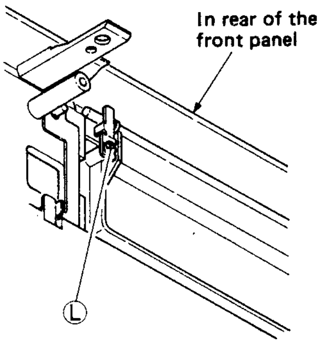


Fig. 1-1-10

### 1.1.8 Main-deck

1. Remove the top cover, front panel assembly and main board assembly.
2. Refer to Fig. 1-1-11 and take out 3 screws Ⓜ from the main-deck assembly.
3. Remove the main-deck assembly in the upward direction and disconnect a connector of CN601 from the Main board, connectors of CN1, CN2 from the Pre/Rec board, connectors of CN1, CN2 from the A/C head board, a connector of CN1 from the Loading MDA board and a connector of CN1 from the Drum MDA board.

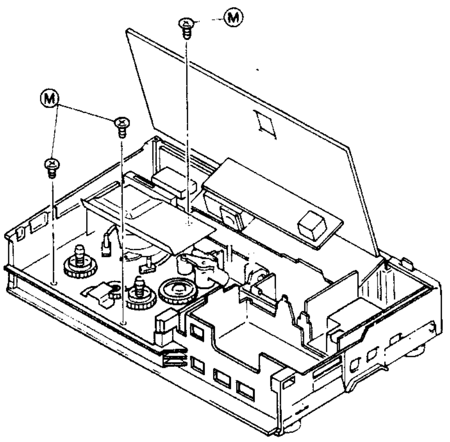


Fig. 1-1-11

## 1.2 MECHANISM ADJUSTMENTS

### 1.2.1 Precautions

1. Disconnect mainframe from AC power before soldering.
2. Avoid imparting stress to wires when disengaging connectors.
3. Determine and correct the cause of difficulty before proceeding to adjustments. Do not disturb settings unnecessarily.
4. Use care not to damage tabs, claws, etc. during repairs.
5. Install the cassette housing assembly only when the mechanism is in the Eject or Stop mode position. In the Eject mode, the internal holder of the housing is fully raised. This is fully lowered in the Stop mode.
6. When installing the front panel assembly, be sure to engage the housing door with the door lever of the cassette housing assembly. If this is omitted, the door will not open at Eject and the cassette cannot be removed.

### 1.2.2 Check without cassette housing

Mechanism operations can be observed easily by removing the cassette housing assembly. Note the following.

1. Disable the photo transistor sensor (END SENSOR) on the main-deck by applying an opaque cover.
2. Connect pins 2 and 3 of Main board connector CN601.
3. Select the desired modes with the operation buttons. However, notice that without tape, setting for the reverse direction modes produces the Stop mode after a few seconds due to absence of the reel sensor output.

### 1.2.3 Manually removing cassette tape

In event of electrical system failure that prevents the tape from being unloaded, the tape can be removed manually by the following procedure. Refer to Figs. 1-3-1, 1-3-2 and 1-3-3.

1. Disconnect power cord from AC outlet.
2. Turn the loading motor by hand so that the control cam rotates clockwise. This retracts the pole base assembly to the unloading position.
3. Continue turning to where the guide arm and half loading gear assemblies shift to beneath the cassette.
4. Turn the clutch assembly (capstan motot) at the rear of the deck to absorb slack tape within the cassette.
5. Again turn the loading motor in the same direction to raise the cassette and remove it.

### 1.2.4 Test equipment

The following special tools and fixtures are required for mechanism adjustment.

1. Alignment tape : MH-2
   Stairstep signal is employed for interchangeability checks and adjustments.
2. Torque gauge : PUJ48075-2
   Measures tape take-up torque.
3. Back tension cassette gauge : PUJ48076-2
   Measures tape tension at the supply side.
4. A/C head positioning tool : PUJ47351-2
   Shifts the head base for adjusting the control head position.
5. Roller driver : PTU94002
   Turns the guide roller for adjusting FM linearity.

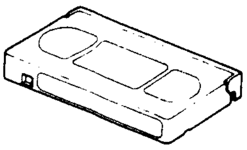
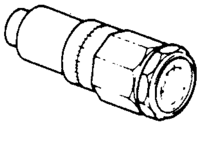
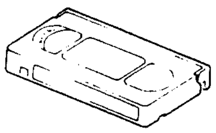
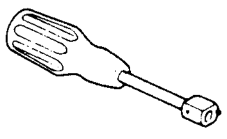
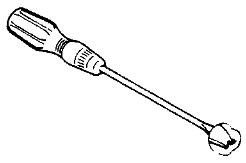
| Alignment tapes<br>1 | Torque gauge<br>2 | Back tension cassette gauge<br>3 | A/C head positioning tool<br>4 | Roller driver<br>5 |
|---|---|---|---|---|
|  |  |  |  |  |

Fig. 1-2-4 Test equipment

## 1.3 MAIN MECHANISM PARTS

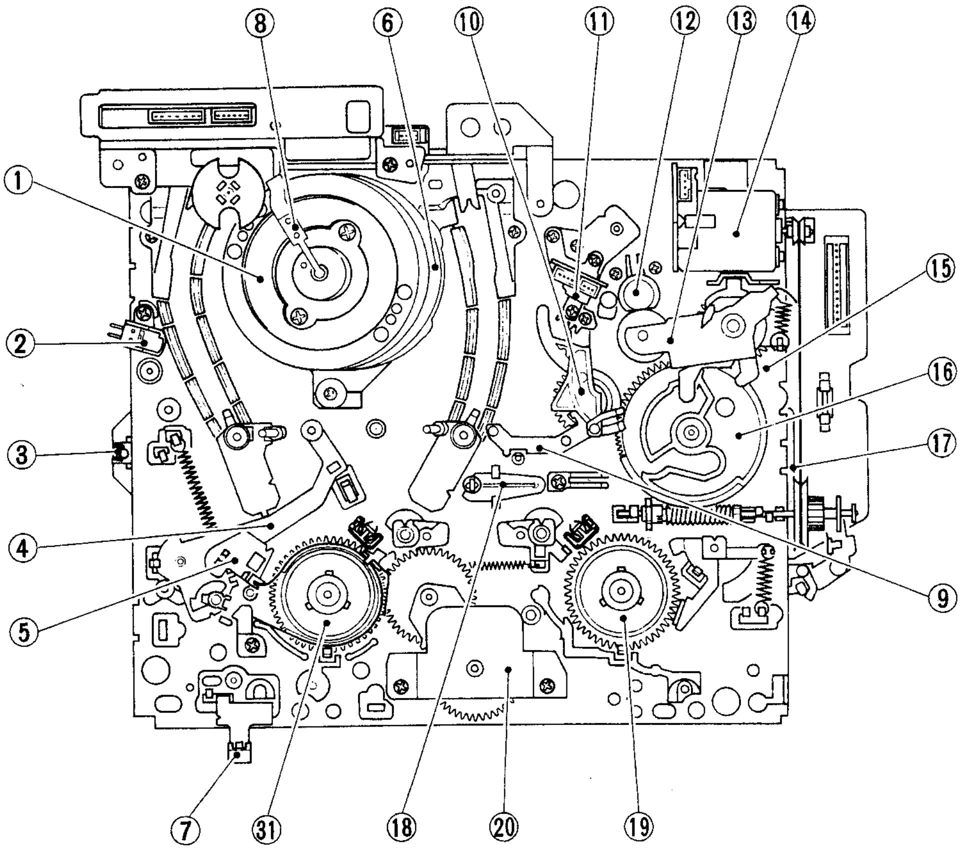

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**Fig. 1-3-1** Top view of main-deck

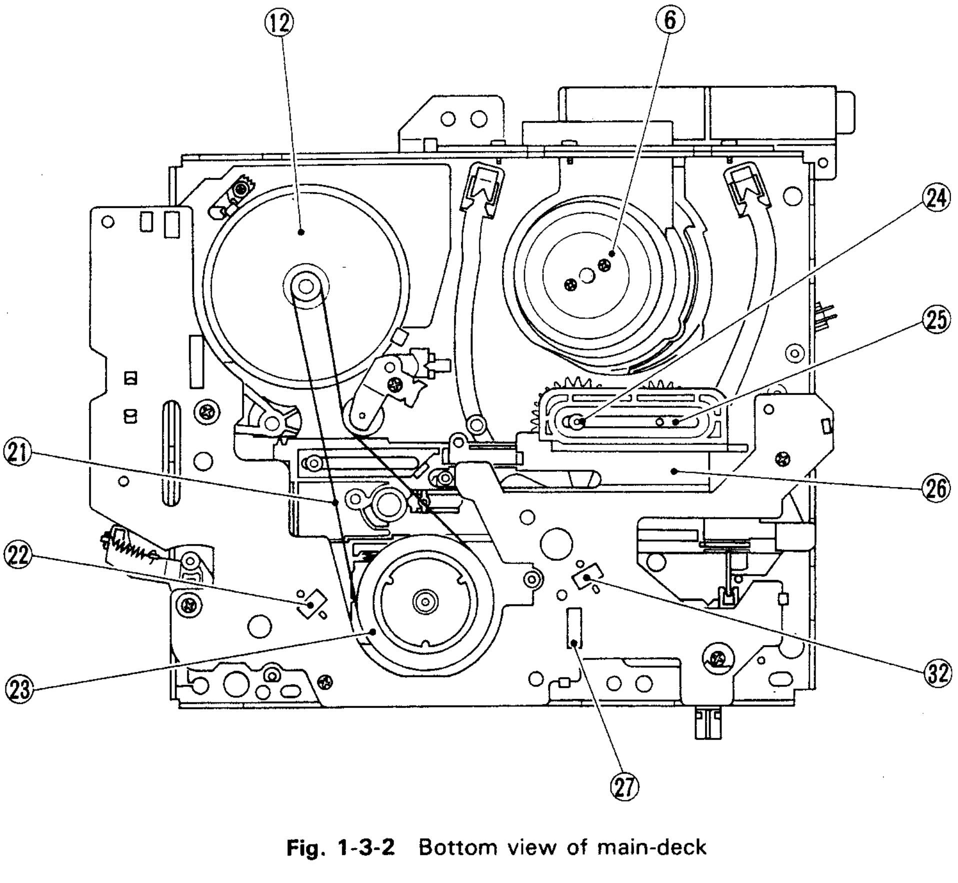
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**Fig. 1-3-2** Bottom view of main-deck

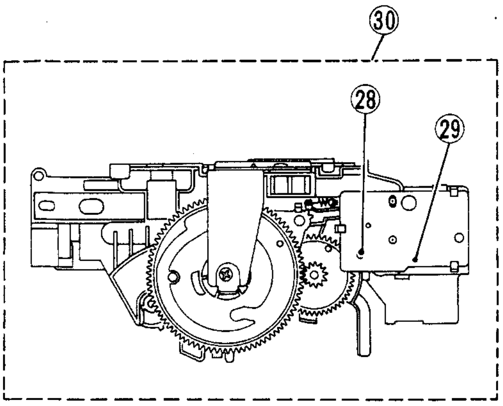


Fig. 1-3-3 Side view of cassette housing

### A. Cleaning

Periodic cleaning of the tape transport system is desirable, but ordinarily not feasible in practice. Therefore, perform cleaning when a set is brought in for repairs or maintenance. Contamination of the video heads, tape guides and brushes can detract from playback picture quality and in extreme cases, even damage the tape. For cleaning, use a fine-mesh cotton cloth (about the texture of a white dress-shirt) moistened in alcohol.

- To clean the video heads, press the moistened cloth gently against the upper drum with fingertip and turn the drum by hand.
- Do not use a vertical stroke, as this may damage the heads.

### B. Lubrication

Oil and grease do not normally require periodic replenshing. Apply only when replacing lubricated parts (also clean and replace lubrication of mating parts if soiled).

For parts and points to apply oil and grease, refer to the exploded views of the mechanism assembly.

Before oiling, clean with alcohol.
Apply one or two drops of oil. Avoid excess oil.

1. Table 1-1 indicates the oil and grease used in this set. Use these or recommended locally available equivalents.

| Category | Part No. |
|---|---|
| Oil | COSMO-HV56 |
| Grease | KANTO-G-31KAV |

Table 1-1

2. Grease is not required for a replacement cassette housing assembly, as this has been applied at the factory.

**Note:** ***Stir grease that has been stored for an extended period.***

### C. Main mechanical parts

See Figs. 1-3-1, 1-3-2 and 1-3-3.

| No. | Symbol | Parts Name | See Section |
|---|---|---|---|
| 1 | M32A | Upper drum assy | |
| 2 | M44 | Full erase head | |
| 3 | 51Q1 | End sensor | |
| 4 | M41 | Tension arm assy | 1.5.4 |
| 5 | M42 | Tension band assy | 1.5.4 |
| 6 | M32C | Lower drum motor assy | 1.5.2 |
| 7 | M461 | REC safety switch (S2) | |
| 8 | M32D | Brush assy | |
| 9 | M449 | Half loading gear assy | 1.5.5 |
| 10 | M447 | Guide arm assy | 1.5.5 |
| 11 | M48 | A/C head | 1.5.3 |
| 12 | M422 | Capstan motor | |
| 13 | M442 | Pinch roller arm assy | |
| 14 | M434 | Loading motor assy | |
| 15 | M446 | Pinch roller cam | 1.5.5 |
| 16 | M438 | Control cam | 1.5.5 |
| 17 | M437 | Loading belt | |
| 18 | M460 | LED holder (D1) | |
| 19 | M430 | Reel disk (take-up) | |
| 20 | M424 | Idler gear unit | |
| 21 | M429 | Timing belt | |
| 22 | 51PHS1 | Take up reel sensor (PS1) | |
| 23 | M426 | Clutch unit | 1.5.6 |
| 24 | M433 | Take up loading arm assy | 1.5.7 |
| 25 | M432 | Supply loading arm assy | 1.5.7 |
| 26 | M439 | Plate assy | 1.5.7 |
| 27 | M462 | Slide switch (S3) | |
| 28 | 56PHS3 | Cassette sensor (PHS3) | |
| 29 | 56Q2 | Start sensor (Q2) | |
| 30 | M36 | Cassette housing assy | |
| 31 | M470 | Reel disk (supply) | |
| 32 | 51PHS2 | Supply reel sensor (PS2) | |

- Symbol interpretation example

M32A
└ Ref. No.
└ Exploded view symbol

56 Q2
└ Ref. No.
└ Board No.

## 1.4 INSPECTION AND MAINTENANCE

This product employs rotary and moving parts which wear out in the course of usage. Periodic inspection, cleaning, lubrication and maintenance are therefore important for ensuring maximum performance. Worn parts must also be replaced at when required.

### 1.4.1 Suggested servicing schedule for main components

The following table indicates the suggested period for such service measures as cleaning, lubrication and replacement. In practice, the indicated periods will vary widely according to environmental and usage conditions. However, the indicated components should be inspected when a set is brought for service and the maintenance work performed if necessary.

Also note that rubber parts may deform in time, even if the set is not used.

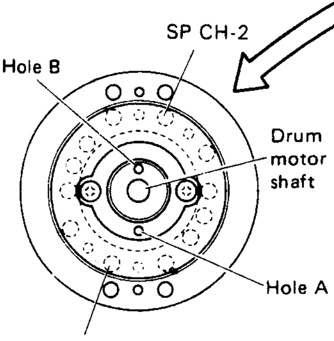
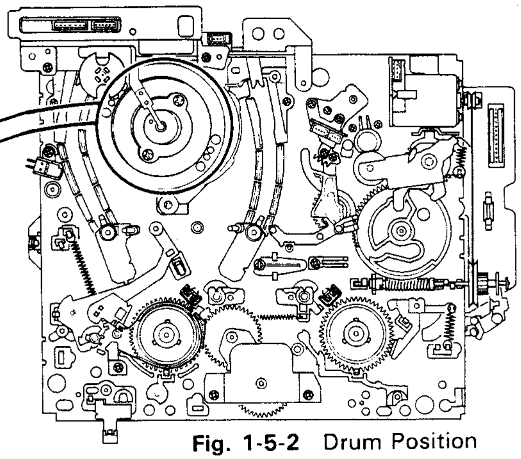
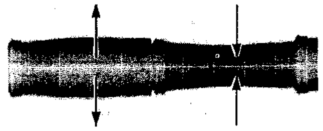
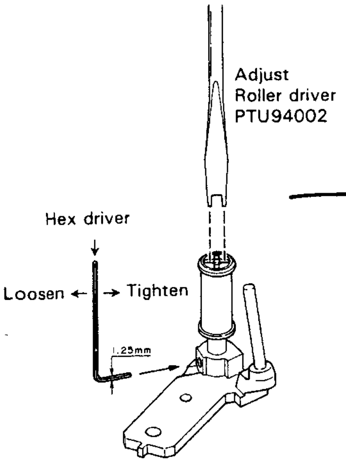
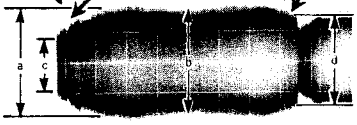
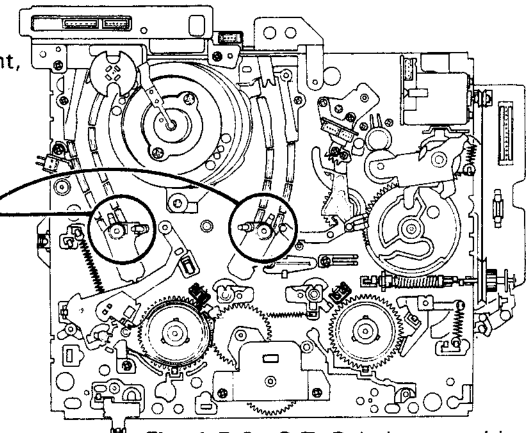
| System | No. | Parts Name | Symbol No. | Periodic servicing schedule (operation hours) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 250 | 500 | 750 | 1000 | 1250 | 1500 | 1750 | 2000 | Overhaul |
| Tape Transport | 1 | Upper drum | M32A | ★ | ★ | ☆ | ○ | ○ | ○ | ○ | ○ | ● |
| | 11 | A/C head | M48 | ★ | ★ | ★ | ○ | ○ | ○ | ○ | ○ | ● |
| | 13 | Pinch roller | M442 | ★ | ★ | ★ | ○ | ○ | ○ | ○ | ○ | ● |
| | 2 | Full erase head | M44 | ★ | ★ | ★ | ○ | ○ | ○ | ○ | ○ | ● |
| | 4 | Tension arm | M41 | | | | | | | | | ● |
| | 6 | Lower drum | M32C | | | | ○ | ○ | ○ | ○ | ○ | ● |
| | 12 | Capstan (shaft) | M422 | ★ | ★ | ★ | ★ | ★ | ★ | ★ | ★ | ● |
| | 9 | Half loading gear | M449 | | | | | | | | | ● |
| | 10 | Guide arm | M447 | | | | | | | | | ● |
| Drive | 12 | Capstan motor | M422 | | | | ○ | ○ | ○ | ○ | ○ | ● |
| | 17 | Loading Belt | M437 | | | | ○ | ○ | ○ | ○ | ○ | ● |
| | 21 | Reel Belt | M424 | | | | ○ | ○ | ○ | ○ | ○ | ● |
| | 19 | Take-up reel disk | M430 | | | | ○ | ○ | ○ | ○ | ○ | ● |
| | 31 | Supply reel disk | M470 | | | | ○ | ○ | ○ | ○ | ○ | ● |
| | 23 | Clutch assy | M426 | | | | | | | | ○ | ● |
| | 14 | Loading motor | M434 | | | | ○ | ○ | ○ | ○ | ○ | ● |
| | | Worm clutch assy | M436 | | | | | | | | △ | ● |
| | 26 | Plate assy | M439 | | | | | | | | △ | ● |
| Others | 5 | Tension band | M42 | | | | ○ | | | | ○ | ● |
| | 8 | Brush | M32D | | | | ○ | | | | ○ | ● |

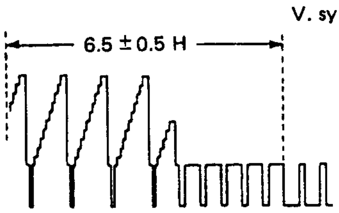
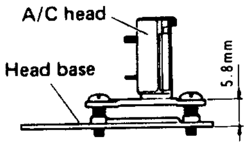
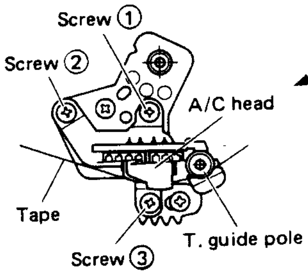
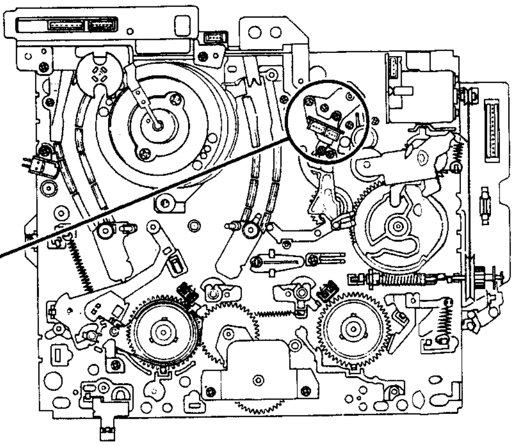
★ : Cleaning
☆ : Cleaning (or Replacement if necessary)
△ : Lubrication
No: Refer to Main mechanical parts

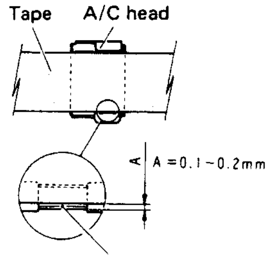
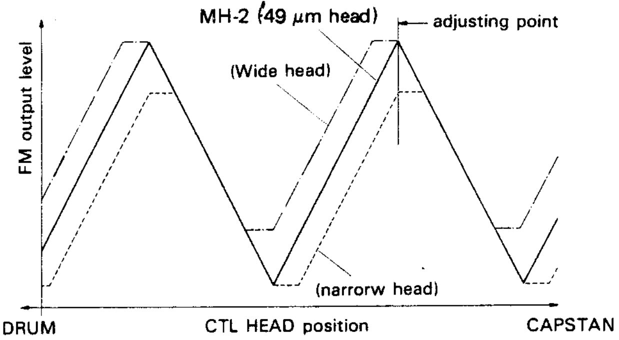
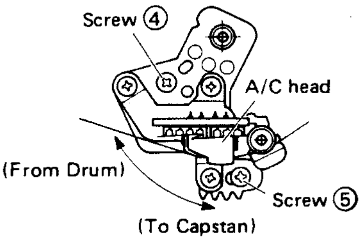
▲ : Lubrication (or Replacement if necessary)
● : Replacement
○ : Inspection or Replacement if necessary

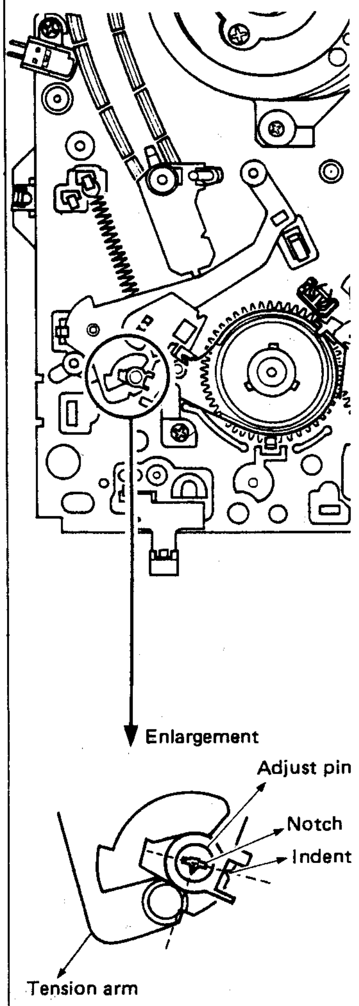
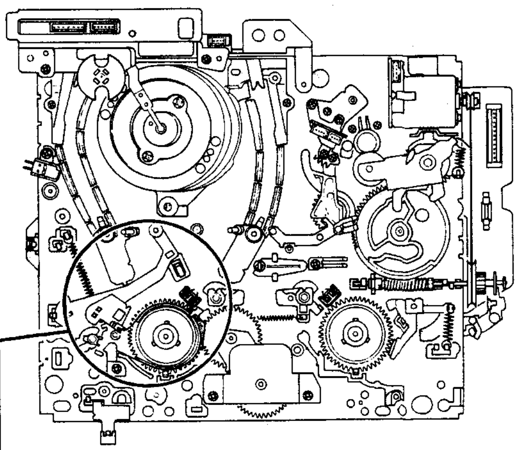
**Table 1-4-1** Approximate maintenance schedule

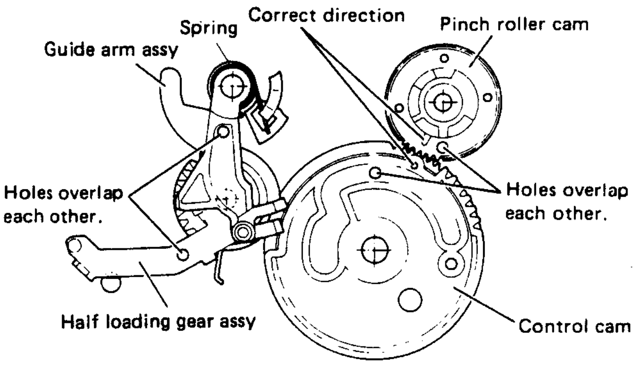
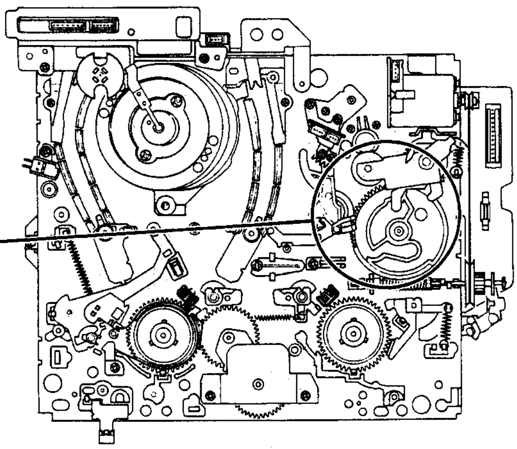
## 1.5 MAIN PARTS REMOVAL AND REPLACEMENT

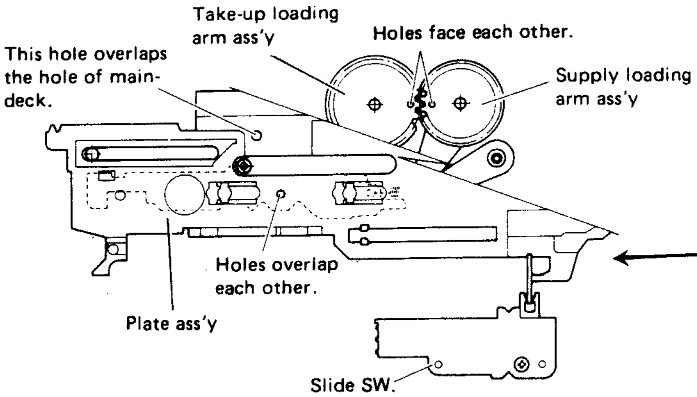
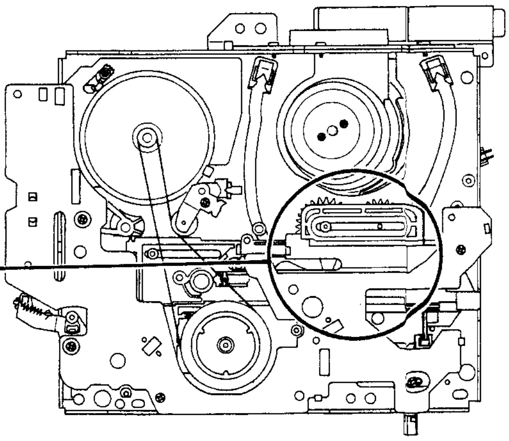
| No. | Item | Checkpoints | Adjustment and Checks |
|---|---|---|---|
| 1 | Upper drum assembly<br>•Symptoms: FM signal absent, intermittent or weak on one channel; large difference in channel output levels<br>•Cause: Worn or damaged video heads, poor response, etc.<br><br> <br>**Fig. 1-5-1**<br>DRUM TOP VIEW | <br>**Fig. 1-5-2** Drum Position<br>Mounting direction<br>See Fig. 1-5-1.<br>(Symptom: no picture) | After replacing, observe that upper drum hole A is opposite the motor axis from lower drum hole B. |
| | | Axis wobble<br>See Fig. 1-5-2.<br>(Symptom: jitter, poor FM linearity)<br>PB FM: Main board TP206<br>DRUM FF: Main board TP411 | Record and playback in SP mode.<br>Confirm absence of large difference between channels. (Fig. 1-5-3)<br><br>**Fig. 1-5-3** Axis wobble |
| | <br> Adjust<br>Roller driver<br>PTU94002<br>Hex driver<br>Loosen<br>Tighten<br>1.25mm<br>**Fig. 1-5-4** S.T. Pole base | FM linearity check<br>See Fig. 1-5-5.<br>(Symptom: vertical sync absent, picture noise)<br>PB FM: Main board TP206<br>FF: Main board TP411<br><br> <br>**Fig. 1-5-5** FM linearity<br>$\frac{b}{a} \geqq 0.7$, $\frac{c}{a} \geqq 0.65$, $\frac{d}{a} \geqq 0.65$ | <br>**Fig. 1-5-6** S.T. Pole base position<br>1) Play stairstep signal of the MH-2 Alignment Tape. Confirm absence of obvious FM waveform loss and that operating the Tracking yields the optimum point.<br>2) Refer to Fig. 1-5-4, adjust for loss at the left edge (drum entry) of the FM waveform by turning the guide roller of the supply pole base. Similarly, adjust for loss at the right edge (drum exit) by turning the guide roller of the take-up pole base.<br>**Note:** *If FM loss occurs on both channels and cannot be corrected by adjusting the guide rollers, the lower drum needs replacement.* |

| No. | Item | Checkpoints | Adjustment and Checks |
|---|---|---|---|
| | PB switching point<br>•Symptom: switching noise at picture bottom. | VIDEO OUT<br><br> <br>Fig. 1-5-7<br>PB Switching Point | 1) Connect an oscilloscope to VIDEO OUT.<br>2) Set the MH-2 alignment tape into the cassette housing. Play back the stairstep segment of MH-2 alignment tape.<br>3) Trigger the oscilloscope externally (– slope) with the signal from TP411 (DRUM FF) of the main board.<br>4) Adjust R420 to position the trigger point 6.5 H ±0.5 H from V. sync as shown in Fig. 1-5-7. |
| 2 | Lower drum assembly<br>•Symptoms: Poor FM linearity, noisy rotation, jitter<br>•Cause: Lead and bearing wear | Check FM linearity and switching point. | See above upper drum assembly items. |
| | | Check control head phase (X value)<br>Symptom: tracking error<br>PB FM: Main board TP206<br>DRUM FF: Main board TP411 | 1) Play stairstep signals of MH-2 Alignment Tape. Engage the Tracking Preset mode by pressing the + and – buttons simultaneously in the onscreen mode.<br>Confirm that the same maximum FM waveform level is obtained as when the tracking is adjusted manually.<br>2) Refer to the A/C head adjustments. |
| 3 | **A/C head**<br><br> <br>Fig. 1-5-8<br>Temporary height<br><br> Screw ①<br>Screw ②<br>A/C head<br>Tape<br>T. guide pole<br>Screw ③<br>Fig. 1-5-9<br>Inclination/Azimuth/Height adj. | <br>Fig. 1-5-10 A/C HEAD position | |
| | | Temporarily set height as indicated in Fig. 1-5-8. | Set the height as indicated in Fig. 1-5-8 to facilitate tape transport checks and adjustments. |
| | | Tilt (forward inclination)<br>See Fig. 1-5-9.<br>(Symptom: audio level varies greatly.) | 1) Run tape, turn screw ① counterclockwise to where slight curling of the tape occurs at the lower flange of the take-up guide roller.<br>2) Then slowly turn the screw clockwise to where the curling ceases. |
| | | Azimuth<br>See Fig. 1-5-9.<br>(Symptoms: audio low level or noisy)<br>Audio output: Main board AUDIO OUT | 1) Play stairstep signal (with audio 6 kHz) of the MH-2 Alignment Tape. Observe audio output signal with oscilloscope.<br>2) Turn screw ② and adjust for maximum audio output level. |

| No. | Item | Checkpoints | Adjustment and Checks |
|---|---|---|---|
| |  <br>**Fig. 1-5-11**<br>Height Adj | Height<br>See Figs. 1-5-9 and 1-5-11.<br>(Symptom: low audio and control signal levels) | 1) Run tape and observe the control head area.<br>2) Turn screws ①, ② and ③ by small and equal amounts until 0.1 to 0.2 mm of the head core bottom can be seen.<br>**Note:** *If difficult to observe, play stairstep signal of MH-2 Alignment Tape and adjust for maximum audio output and control pulse level.* |
| | | FM linearity | Refer to upper drum assembly items.<br>If adjustment is major, again check the azimuth. |
| |  <br>**Fig. 1-5-13** CTL head phase<br>**Note:** *Trigger the oscilloscope externally signal from TP411 (DRUM FF). Use (+) trigger for MH-2 alignment tape.* | Control head phase<br>See Fig. 1-5-12<br>PB FM: Main board TP206<br>DRUM FF: Main board TP411<br> Screw ④<br>A/C head<br>(From Drum)<br>Screw ⑤<br>(To Capstan)<br>**Fig. 1-5-12** CTL head phase | 1) Play stairstep signal of MH-2 Alignment Tape and observe the FM waveform. Set for Tracking Preset by pressing the + and − buttons simultaneously in the onscreen mode.<br>2) Loosen screws ④ and⑤. Set the A/C head positioning tool on screw ④, with the stud inserted into the nearby oblong hole.<br>3) Turn the tool first to position the A/C head fully toward the capstan. Then gradually return it toward the drum and stop at the position of maximum FM waveform output level as shown in Fig. 1-5-13.<br>4) Tighten screw ⑤ . Remove the tool and tighten screw ④. |

| No. | Item | Checkpoints | Adjustment and Checks |
|---|---|---|---|
| 4 | Tension arm assembly<br>Tension band assembly<br><br> <br>**Fig. 1-5-14** Tension arm assy | Tension pole position<br>See Fig. 1-5-14.<br>(Symptom: poor FM waveform response) | <br>**Fig. 1-5-15** Tension arm position<br>1) Check that the cassette housing is in the eject state (internal holder of the cassette housing is locked in raised position).<br>2) Turn the eccentric adjust pin to align the notch of the pin with the tension arm indent as shown in Fig. 1-5-14. |
| | | Back tension<br>(Symptom: skew) | 1) When the tension pole position is correctly adjusted, the back tension will assume the correct value.<br>2) Use the Back Tension Cassette Gauge and set for the playback mode. Confirm reading of 35 to 48.<br>3) Changing the tension pole position in order to vary the back tension will cause adverse effects elsewhere. |

| No. | Item | Checkpoints | Adjustment and Checks |
|---|---|---|---|
| 5 | Pinch roller cam<br>Control cam<br>Half loading gear assembly<br>Guide arm assembly | | Set mechanism to Eject mode (internal holder of the cassette housing is locked in raised) position. |
| |  Spring<br>Correct direction<br>Pinch roller cam<br>Guide arm assy<br>Holes overlap each other.<br>Holes overlap each other.<br>Half loading gear assy<br>Control cam<br>**Fig. 1-5-16** Control/Pinch roller cam | Important: Do not remove or disturb parts other than those mentioned.<br>See Fig. 1-5-16. | <br>**Fig. 1-5-17** Control cam position<br>1) When installing the pinch roller cam, overlap the largest hole of the gear portion with the hole of the deck.<br>2) Set the control cam on the deck with the hole of the groove overlapped with the hole of the deck. Observe that the small hole of the control cam and the ridge of the pinch roller cam are aligned.<br>(If the control cam does not fit readily, shift the rear plate assembly within the range of play.)<br>3) Install the half loading gear assembly with the hole overlapped with the hole of the deck. Secure with E-ring.<br>4) Install the guide assembly over the spring and with the hole overlapping that of the deck. Engage the spring correctly. |
| | | Cassette housing assembly | Install the cassette housing assembly with the mechanism in the Eject mode. Also observe that the inner holder of the housing is raised and locked. |
| 6 | Clutch assembly | Take-up torque<br>(Symptom: inadequate take-up torque) | 1) Remove cassette housing and set for playback mode (see Section 1.2).<br>2) Set torque gauge on the take-up reel disk. Gradually relax your grip on the gauge and read the needle indication at the point the gauge begins to rotate with the disk. Confirm indication of 60 to 100. |

| No. | Item | Checkpoints | Adjustment and Checks |
|---|---|---|---|
| 7 | Take-up loading arm assembly<br>Supply loading arm assembly<br>Plate assembly | | **Note:**<br>• *Set mechanism to the Eject or Stop mode before removing these parts.*<br>• *The flange of the plastic rivet securing the loading arm assembly and the pole base assembly can be damaged by attempting to remove it directly. Press the loading arm assembly firmly to prevent motion. Then use a narrow-shafted tool to press the rivet from the shaft end to remove it.* |
| | | Mounting position alignment<br>• Remove the tension arm assembly to facilitate operation.<br>See Fig. 1-5-18. | 1) Set the supply and take-up loading arm assemblies so that the holes of the gear portions are aligned, then secure to the pole base assemblies with rivets.<br>2) Shift the plate assembly and install with the holes of the upper and lower components overlapped. |
| | | Slide switch<br>See Fig. 1-5-18. | Be sure to engage the slide switch slider with the edge of the plate assembly. |
| |  Take-up loading arm ass'y<br>Holes face each other.<br>This hole overlaps the hole of main-deck.<br>Supply loading arm ass'y<br>Holes overlap each other.<br>Plate ass'y<br>Slide SW.<br>Fig. 1-5-18 | | <br>Fig. 1-5-19<br>T.S. Loading arm position |

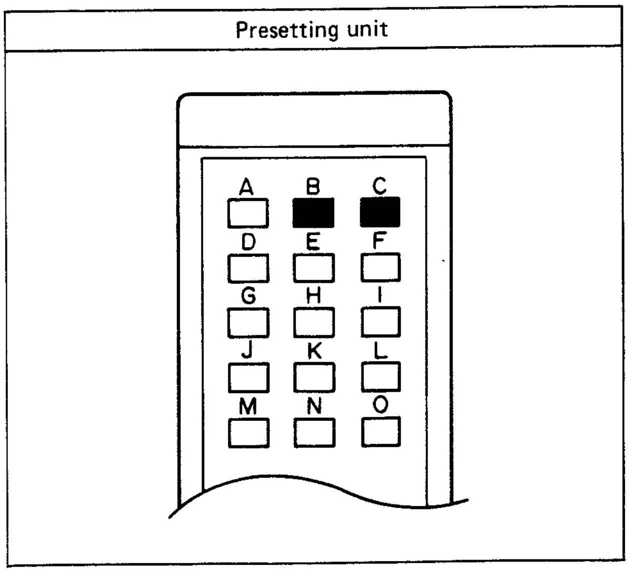
# SECTION 2
# ELECTRICAL ADJUSTMENTS

## 2.1 PREPARATION

Electrical adjustments are required after replacing circuit components and certain mechanical parts.
It is important to perform these adjustments only after all repairs and replacements have been completed. Also, do not attempt these adjustments unless the proper equipment is available.

### 2.1.1 Required test equipment

1. Color television or monitor
2. Oscilloscope: wide-band, dual-trace, triggered delayed sweep
3. Frequency counter
4. Audio oscillator
5. Audio voltmeter
6. Digital voltmeter
7. Signal generator: RF/IF sweep/marker
8. Signal generator: PAL color bar, stairstep, video sweeper
9. Signal generator: Audio multiplex TV signal generator
10. Recording tape
11. Alignment tape: MH-2
12. Presetting unit (PTU94008)


Presetting unit
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O

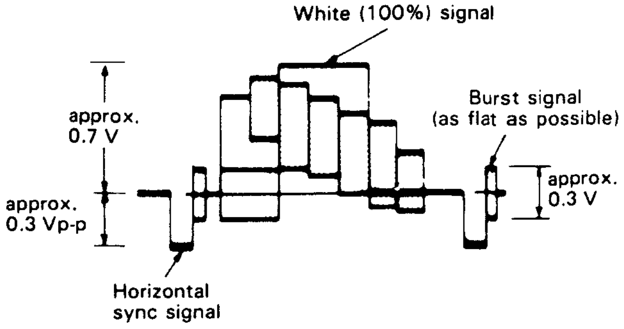

White (100%) signal
approx.
0.7 V
Burst signal
(as flat as possible)
approx.
0.3 V
approx.
0.3 Vp-p
Horizontal
sync signal

**Fig. 2-1-1** Color bar signal of pattern generator

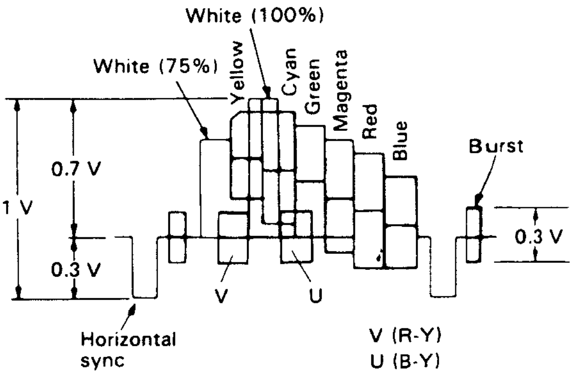

White (100%)
White (75%)
Yellow
Cyan
Green
Magenta
Red
Blue
Burst
0.7 V
1 V
0.3 V
0.3 V
V
U
Horizontal
sync
V (R-Y)
U (B-Y)

**Fig. 2-1-2** Color bar signal waveform

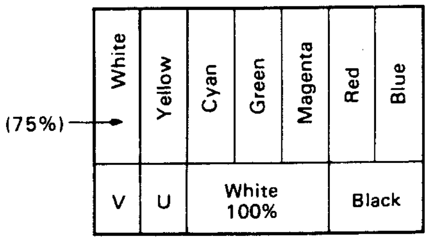

White
Yellow
Cyan
Green
Magenta
Red
Blue
(75%)
V
U
White
100%
Black

**Fig. 2-1-3** Color bar pattern

### 2.1.2 Check and adjustment steps

The check and adjustment steps are provided in the following in the form of charts. For clarity, the nomenclature used in the charts is outlined below.

| | |
|---|---|
| **No.** | Checks and adjustments are numbered in the recommended sequence in which they are to be performed. |
| **Item** | Name assigned to the particular check and adjustment step. |
| **Check Point** | Location to which measuring instrument (oscilloscope unless otherwise noted) is to be connected. |
| **Adjustment Parts** | Variable component (resistor, capacitor, etc.) to be adjusted in this step. Dash (–) indicates check only. |
| **Signal & Mode** | • Input signal required to perform adjustment. Dash (–) indicates that special signal is not required.<br>• Equipment operating mode at time of check or adjustment. |
| Color bars | Color bars signal as video input. |
| Stairstep | Stairstep signal as video input. |
| 1 kHz | 1 kHz sinewave as audio input signal. |
| MH-2 color bars | Color bars segment of MH-2 alignment tape. |
| MH-2 stairstep | Stairstep segment of MH-2 alignment tape. |
| MH-2 1 kHz | 1 kHz audio signal segment of MH-2 alignment tape. |
| MH-2 RF sweep | RF sweep segment of MH-2 alignment tape. |
| E-E | Power on and machine in Stop mode. |
| REC | Recording mode |
| PB | Playback mode |
| SEARCH | Search (FWDS and REVS) playback mode |
| SLOW | Slow motion playback mode |
| STILL | Pause during playback mode |
| SP mode | SP recording speed |
| **Description** | This column provides an explanation of the step, notes and adjustment values. |

## 2.2 SWITCHING REGULATOR CIRCUIT

Note: *Unless otherwise specified, all test points and adjustments are located on the SWITCHING REGULATOR board.*

| No. | Item | Check Point | Adjustment Parts | Signal & Mode | Description |
|---|---|---|---|---|---|
| 1 | 5 V DC output voltage | TP1 | R37<br>(5 V DC) | •REC<br>•SOURCE SEL: TUNER | 1) Connect a digital voltmeter between TP1 and TP-GND.<br>2) Record in the TUNER mode, adjust R37 for 5.3 ± 0.05 V. |

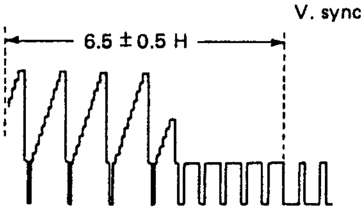
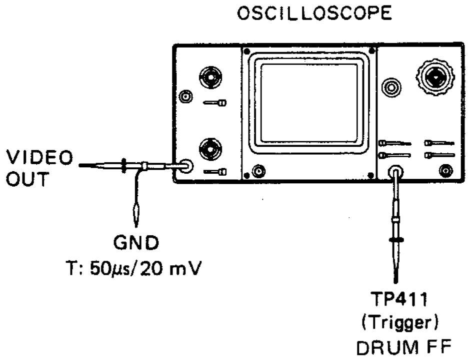
## 2.3 TIMER CIRCUIT

Note: *Unless otherwise specified, all test points and adjustments are located on the TIMER board.*

| No. | Item | Check Point | Adjustment Parts | Signal & Mode | Description |
|---|---|---|---|---|---|
| 1 | Clock | IC1-16 | C6<br>(Timer clock) | •E-E | Note: *For below adjustments use 1 : 1 probe with input capacitance less than 100 pF.*<br>1) Connect a frequency counter between IC1-16 and GND.<br>2) Short TP1 to GND, then short the leads of capacitor C3 once in order to reset ICl. All FDP Segments and power LED are on.<br>3) Adjust C6 for 2048.000 ± 0.002 Hz (488.2808 to 488.2818 μs). |

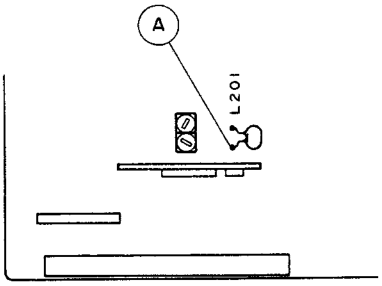
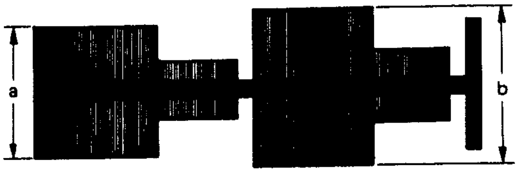
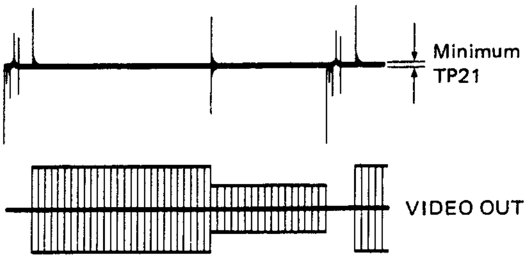
## 2.4 SERVO CIRCUIT

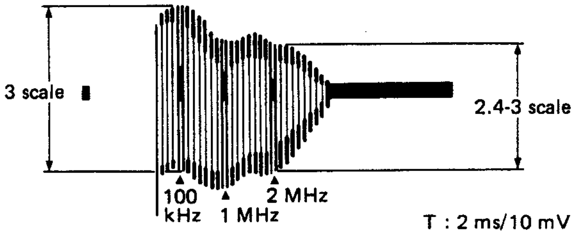
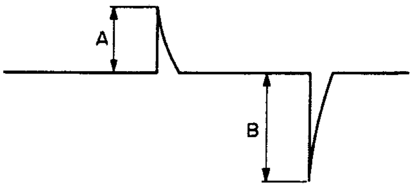
**Note:** *Unless otherwise specified, all test points and adjustments are located on the MAIN board.*

| No. | Item | Check Point | Adjustment Parts | Signal & Mode | Description |
|---|---|---|---|---|---|
| 1 | SP PB switching point | VIDEO OUT | R420<br>(SP SW point)<br><br> <br>**Fig. 2-4-1** Switching point | •PB<br>•MH-2 (stairstep)<br>•Trigger slope (–)<br>•SP mode<br>•AUTO TRACKING : OFF | 1) Connect an oscilloscope to VIDEO OUT.<br>2) Play back the stairstep segment of MH-2 alignment tape.<br>3) Trigger the oscilloscope externally (– slope) with the signal from TP411.<br>4) Adjust R420 to position the trigger point 6.5 ± 0.5H from V. sync.<br><br> OSCILLOSCOPE<br>VIDEO OUT<br>GND<br>T: 50µs/20 mV<br>TP411<br>(Trigger)<br>DRUM FF<br>**Fig. 2-4-2** Oscilloscope |
| 2 | SP slow tracking preset | Monitor-TV | Presetting unit<br>(PTU 94008) | • SP mode<br>• REC then PB (slow)<br>• AUTO TRACKING : OFF<br>• SOURCE SEL : AUX | **Note:** *Set VCR to A mode by remote controller. During playback press the PAUSE button for "more than 2 seconds" to begin a slow motion playback.*<br>1) Set recording video tape into the cassette housing.<br>2) Receive a color broadcast on a VHF-HI channel or supply a color bar signal to VIDEO IN.<br>3) Record a color broadcast or color bar signal in the SP mode.<br>4) Play back recorded signal in the FWD slow mode and set the tracking control of the FRONT panel to the center position by simultaneously pressing the (+) and (–) tracking buttons.<br>5) Observe the display on a monitor-TV and adjust for optimum noise condition (best tracking) by depressing "B (–)" or "C (+)" buttons of presetting unit as required.<br>6) Depress the STOP button on the FRONT panel.<br>7) Confirm that the bar noise is not visible on the monitor in the slow mode. |

## 2.5 VIDEO CIRCUIT

**Note:** *1. Unless otherwise specified, all test points and adjustment parts are located on the MAIN board.*
*2. T indicates the time and volts division setting of the oscilloscope (Use 10 : 1 probe).*

| No. | Item | Check Point | Adjustment Parts | Signal & Mode | Description |
|---|---|---|---|---|---|
| 1 | REC color level and ch balance<br><br> <br>**Fig. 2-5-1** Component view of VIDEO UNIT board | L201- Ⓐ (VIDEO UNIT board) | R220 (SP REC color level) | • PB mode<br>• MH-2 color bar<br>• SP mode | 1) Connect an oscilloscope to L201- Ⓐ (IC201-19) pin as shown in Fig. 2-5-1 and observe color signal level.<br>2) Set the MH-2 alignment tape into the cassette housing, play back the color bar segment of MH-2 alignment tape.<br>3) Set the tracking of the FRONT panel to the Auto tracking off position by simultaneously pressing the "+" and "–" tracking buttons.<br>4) Adjust by pressing the "+" and "–" tracking buttons of the Front panel for maximum level of the color waveform and make a note of the higher color level "A".<br>5) Press the STOP button on the FRONT panel and eject the MH-2 alignment tape. |
|  | <br> <br>**Fig. 2-5-2** REC color level |  |  | • REC then PB<br>• MH-2 color level<br>• AUTO TRACKING : OFF<br>• SP mode<br>• SOURCE SEL : AUX | 6) Set recording video cassette into the cassette housing. Supply a color bar signal to VIDEO IN.<br>7) Trigger the oscilloscope externally with the signal from TP411 (DRUM FF) of the Main board. Use (–) trigger for CH1 and (+) trigger for CH2.<br>8) Record a color bar signal in the SP mode.<br>9) Play back recorded color bar signal. Set the tracking of the FRONT panel to the Auto tracking off position by simultaneously pressing the "+" and "–" tracking buttons and confirm 85 ± 5% of the noted color level at IC201-19. If necessary, before recording, adjust R220 so that the higher level channel becomes 85 ± 5% of the noted level "A" during playback as shwon in Fig. 2-5-2. At this time, confirm that the channel level difference is within 3 dB.<br>**Note:** *Repeat the above step (9) several times.* |
| 2 | YNR NC balance<br><br> <br>**Fig. 2-5-3** | TP21 (IC1-26) (VIDEO UNIT board) | R16 (NC BAL) (VIDEO UNIT board) | • E-E<br>• SOURCE SEL: AUX<br>• Color bar<br>• SP mode<br>• AUTO TRACKING : OFF | 1) Supply a color bar signal to VIDEO IN and connect an oscilloscope to TP21 (IC1-26 pin).<br>2) Adjust R16 for minimum DC step difference.<br>T: 2ms/5mV |

| No. | Item | Check Point | Adjustment Parts | Signal & Mode | Description |
|---|---|---|---|---|---|
| 3 | SP PB<br>Frequency | VIDEO OUT<br>(TP210)<br> <br>**Fig. 2-5-4** PB frequency | R226<br>(PB EQ) | • REC then PB<br>• Video sweep<br>• AUTO TRACKING : OFF<br>• SOURCE SEL : AUX<br>• SP mode | 1) Terminate VIDEO OUT with monitor - TV (75 Ω load), supply a video sweep signal without burst to VIDEO IN.<br>2) Set recording video cassette into the cassette housing. Record a video sweep signal without burst in the SP mode.<br>3) Connect an oscilloscope to VIDEO OUT. Play back recorded video sweep signal in the SP mode, set the tracking of the Front panel to the Auto tracking off position by simultaneously pressing the (+) and (–) tracking buttons.<br>4) Use the control of the oscilloscope to position the 100 kHz region at graduation 3 (0 dB) of the oscilloscope scale.<br>5) Adjust R226 to position the 2 MHz of channel-1 portion at 2.4 – 3.0 (–1 ± 1 dB) of the oscilloscope graduations as shown in Fig. 2-5-4. At this time, confirm that the channel difference is within 3 dB. |
|  |  |  | R226 | • REC then PB<br>• TV broadcast<br>• AUTO<br>• TRACKING : OFF<br>• SP mode<br>• SPURCE SEL :AUX | **Alternate method**<br>1) Set recording video cassette into the cassette housing, receive a colour broadcast on a VHF channel.<br>2) Record a colour broadcast that shows a good depiction of human facial contours.<br>3) Play back recorded colour broadcast, set the tracking of the Front panel to the Auto tracking off position by simultaneously pressing the (+) and (–) tracking buttons.<br>4) Adjust R226 to obtain distinct facial features on the monitor.<br>**Note:** ***R226 nearly at centre position.*** |
| 4 | SECAM DET. | IC251-18<br>(VIDEO UNIT board) | LC251<br>(VIDEO UNIT board) | • E-E<br>• SECAM color bar | 1) Connect an oscilloscope to pin 18 of IC251.<br>2) Adjust LC251 so that A and B are related as follows:<br>A : B = 3 : 4 = 0.84 Vp-p : 1.11 Vp-p<br> <br>**Fig. 2-5-5** |

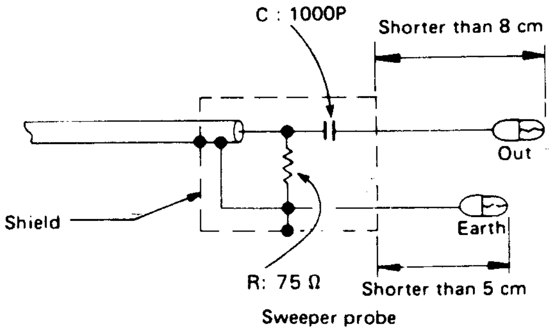
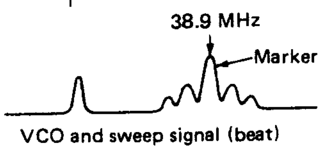
## 2.6 AUDIO CIRCUIT

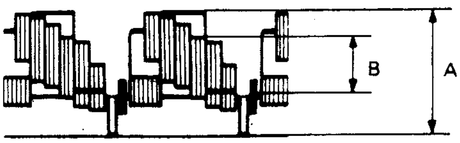
Note: *Unless otherwise specified, all test points and adjustments are located on the MAIN board.*

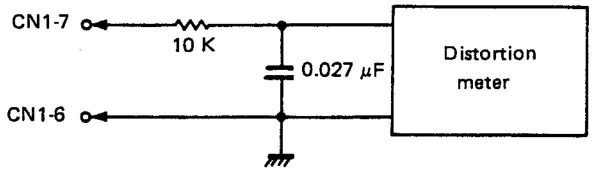
| No. | Item | Check Point | Adjustment Parts | Signal & Mode | Description |
|---|---|---|---|---|---|
| 1 | Audio Bias Level | TP31 (+)<br>TP32 (−) | R11<br>(Bias adj) | • SOURCE SEL : AUX<br>• SP mode<br>• REC mode<br>• No signal | 1) Connect a millivoltmeter between TP31 and TP32.<br>2) Set for REC mode without incoming signal.<br>3) Adjust R11 for 1.9 mVrms. |

## 2.7 TUNER/IF CIRCUIT

Note: *Unless otherwise specified, all test points and adjustments are located on the IF board.*

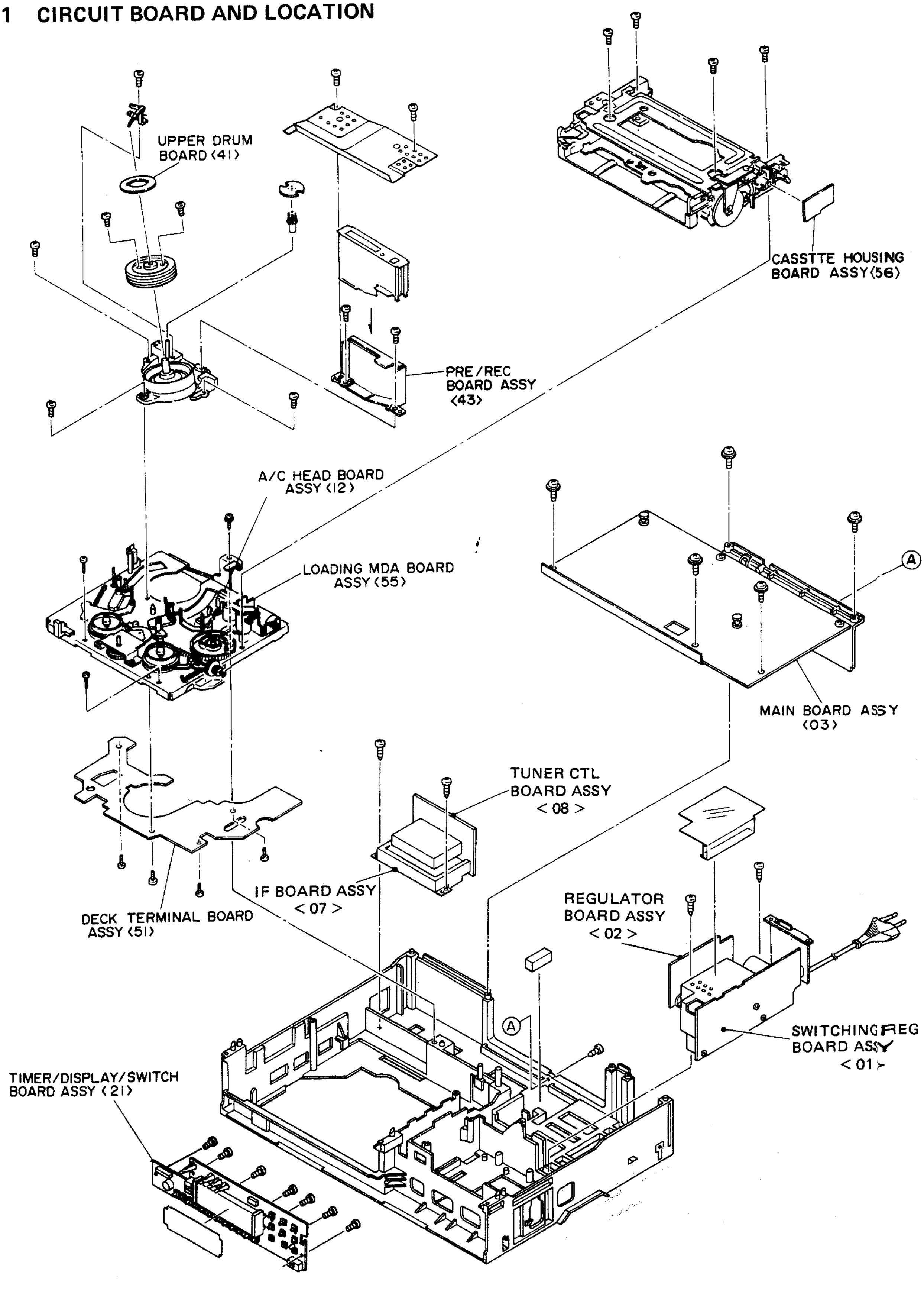
| No. | Item | Check Point | Adjustment Parts | Signal & Mode | Description |
|---|---|---|---|---|---|
| | **Equipment required:**<br>1. Oscilloscope<br>2. IF sweep signal genrator with suitable markers (PIF, etc.)<br>3. Sweeper probe (sweep signal supply cable) as shown below. | | | |  C : 1000P<br>Shorter than 8 cm<br>Out<br>Shield<br>Earth<br>R: 75 Ω<br>Shorter than 5 cm<br>Sweeper probe<br>**Fig. 2-7-1** |
| 1 | VCO<br> <br>**Fig. 2-7-2** | IC1-28 | T2 (VCO) | • Sweep genrator out: 70 dBμ (38.9 MHz)<br>• Tuner mode without antenna IN | 1) Use a sweeper probe as shown in Fig. 2-7-1 and connect the sweep generator output to pin 1 of SAW 1.<br>Adjust the sweep gain so that the waveform does not distort as observed with the oscilloscope.<br>Connect the oscilloscope to pin 28 of IC1 (VIDEO DET OUT) and adjust T2 to align the waveform with the frequency marker as shown in Fig. 2-7-2. |
| | | | | • TV broadcast<br>• Tuner mode | **Alternate method:**<br>1) Receive a color broadcast on a VHF-HI channel.<br>2) Adjust T2 to obtain a fine picture on the monitor. |

| No. | Item | Check Point | Adjustment Parts | Signal & Mode | Description |
|---|---|---|---|---|---|
|  | ● **Before the following adjustments:**<br>1. Connect a cable to ANT IN and terminate TV OUT at 75 Ω.<br>2. Set a TV channel signal generator as follows.<br>Video : 65 dBμ/75 Ω, color bar 87.5% modulation<br>Audio : 55 dBμ/75 Ω, 1 kHz ± 50 kHz deviation |  |  |  |  |
| 2 | RF AGC | IF terminal of Front end | R21<br>(RF AGC) | • TV signal<br>• Tuner mode | 1. Connect the oscilloscope to IF terminal of UHF Tuner (Front end). Adjust R21 for maximum level, then again adjust R21 for –5 dB again. |
|  |  | MONITOR | R21 | • TV broadcast<br>• Tuner mode | **Alternate method:**<br>**Note:** *Adjust R21 (RF AGC) to correct for excess noise in the picture or when streaky cross interference occure bue to strong electrical fields.*<br>1. Adjust R21 to minimize noise or streaks on the TV screen.<br>2. Check for absence of abnormality on all channels. |
| 3 | AFC | IC1-16 | T3<br>(AFC) | • TV broadcast<br>• Tuner mode | 1. Receive a color broadcast or signal generator on a VHF-HI channel.<br>2. Connect oscilloscope to pin 16 of IC1.<br>3. Set the oscilloscope to DC mode and adjust T3 to set the lower adge of the ripple waveform to 4.5 V. |
| 4 | Color Level<br><br> <br>B: magenta A:B = 1:0.48<br>Fig. 2-7-3 | CN1-4<br>(VIDEO OUT)<br>(TUNER CTL board) | R40<br>(Color level) | • TV signal<br>• Tuner mode<br>• Color bar | 1. Receive a color bar signal. Set the Y level for 100% reference signal and then adjust R40 for a magenta level of 48% at pin 4 of CN1. |

| No. | Item | Check point | Adjustment Parts | Signal & Mode | Description |
|---|---|---|---|---|---|
| 5 | SOUND DET | CN1-7<br>(TUNER CTL board)<br> <br>Fig. 2-7-4 Adjustment circuit | T4<br>(Sound det) | • TV signal<br>• Tuner mode | 1. Use a adjustment circuit as shown in Fig. 2-7-4, connect a distortion meter as shown in Fig. 2-7-4.<br>2. Adjust T4 for minimum distortion. |
|  |  | CN1-7<br>(TUNER CTL board) | T4<br>(Sound det) | • TV broadcaset<br>• Tuner mode | **Alternate method:**<br>1. Receive a color broadcast on a VHF-HI channel. Connect an oscilloscope to CN1-7 of the TUNER CTL board.<br>2. Adjust T4 for maximum level at audio sound. |

# SECTION 3
# CHARTS AND DIAGRAMS

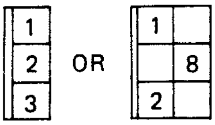
## 3.1 CIRCUIT BOARD AND LOCATION


UPPER DRUM BOARD ‹41›
PRE/REC BOARD ASSY ‹43›
CASSTTE HOUSING BOARD ASSY‹56›
A/C HEAD BOARD ASSY ‹12›
LOADING MDA BOARD ASSY ‹55›
Ⓐ
MAIN BOARD ASSY ‹03›
TUNER CTL BOARD ASSY < 08 >
IF BOARD ASSY < 07 >
DECK TERMINAL BOARD ASSY ‹51›
REGULATOR BOARD ASSY < 02 >
Ⓐ
SWITCHING REG BOARD ASSY < 01 >
TIMER/DISPLAY/SWITCH BOARD ASSY ‹21›

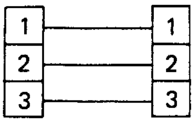
## 3.2 GENERAL INFORMATION

### 3.2.1 Connections

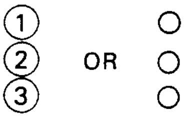
**Note:**
Unless otherwise specified, only signal input flow is indicated.
Connection arrows indicate only signal outputs.



: Connectors



: Board in connectors



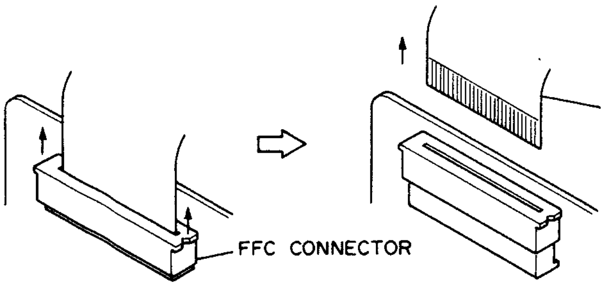
: Direct connections

(VS)
(MS)
(SM)

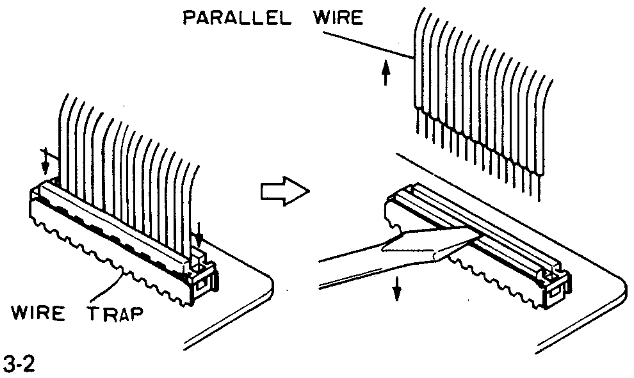
: Connected pattern in the board.
Abbreviations
V : Video M : Mechacon
S : Servo A : Audio
VS : Signal flow from video to servo.

### 3.2.2 Disconnecting the flatwire

1. Pull the connector structure upward to release the clamp when removing or inserting the flat wire cable.

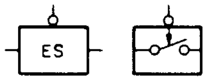


2. Depress the connector structure downward to release the clamp when removing or inserting the flat wire cable, as indicated below.

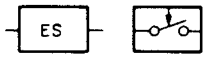


### 3.2.3 Indications

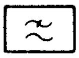
AUX : Active only at high.
$\overline{\mathrm{AUX}}$ : Active only at low.
$\bar{\mathrm{A}}\bar{\mathrm{U}}\bar{\mathrm{X}}$ : Active only at middle.
$\bar{\mathrm{A}}\mathrm{U}\bar{\mathrm{X}}$ : Active only at open.



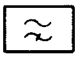
: Active only at low for electronic switch.



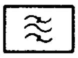
: Active only at high for electronic switch.



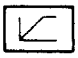
: Low pass filter.



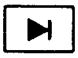
: High pass filter.



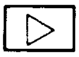
: Band pass filter.



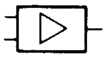
: Limiter.



: Detector



: Amplifier.



: Mixer stage.

### 3.2.4 Schematic diagram values

Unless otherwise specified.

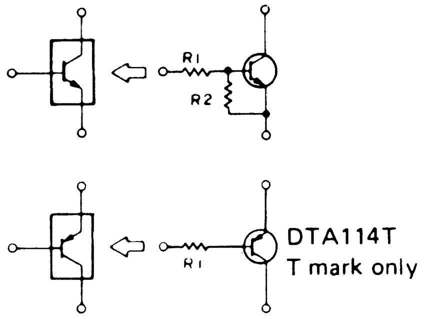
1. All resistance values are in ohms, 1/6 W, 1/8 W, (refer to parts list).
2. All capacitance values are in $\mu$F, (P; PF).
3. All inductance values are in $\mu$H, (m; mH).
4. All diodes are 1SS133 or MA165, (refer to parts list).
5. Voltages are DC-measured (reference to ground) with a digital voltmeter during recording (SP mode) and playback (SP mode) with alignment tape. Where voltages differ between recording and playback, the voltage during playback is shown in parentheses.
6. Waveforms (VIDEO System) are measured (reference to ground) with a color bar during recording (SP mode) and playback (SP mode) with alignment tape.
7. Waveforms (AUDIO System) are measured (reference to ground) with 1 kHz (−8 dBs) during recording and playback with alignment tape (1 kHz).
8. Shaded (▨) parts are critical for safety.
Replace only with specified parts numbers.

### 3.2.5 Signal flow in the schematic

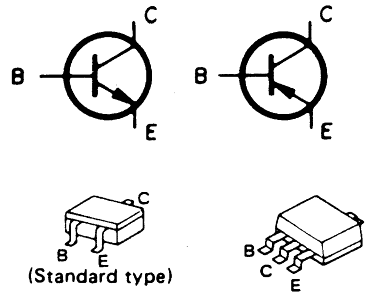
➡ Recording signal path
⇨ Playback signal path
➩ REC/PB signal path

### 3.2.6 Semiconductors

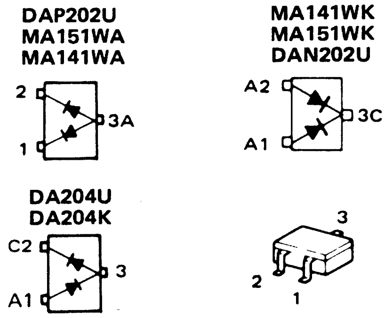
1. Digital transistor


R1
R2
R1
DTA114T
T mark only

2. Chip transistor


C
B
E
C
B
E
C
B
E
(Standard type)
B
C
E

3. Chip diode


DAP202U
MA151WA
MA141WA
2
1
3A
MA141WK
MA151WK
DAN202U
A2
A1
3C
DA204U
DA204K
C2
A1
3
3
2
1

**Note:**
The digital transistor includes built in resistors.
It features small size and high reliability.
Both PNP and NPN types are available.

**Uses:**
Inverter, Interface, driver circuits.

### 3.2.7 Replacement of chip parts

For replacing chip parts, proceed it as follows.
Use a well insulated fine-tipped soldering iron (approx. 17 W, 130°C ~ 260°C in temp.).
In addition, it is recommended to use a soldering iron (55 W approx.) with solder absorber for convenience.

**Caution:**
- Do not apply heat for more than 3 seconds.
- Do not rub electrodes.
- Do not reuse chips removed once. Discard them.
- Supplementary cementing is not required.

#### 1. Soldered condition of chip parts

- Resistors, capacitors, etc.

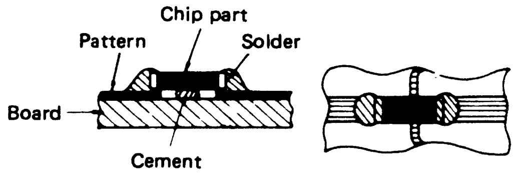

Chip part
Pattern
Solder
Board
Cement

**Fig. 3-2-1** Soldering condition-1

- Transistors, diodes, etc.

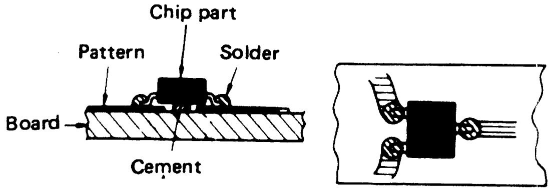

Chip part
Pattern
Solder
Board
Cement

**Fig. 3-2-2** Soldering condition-2

#### 2. How to remove chip parts

- Resistors, capacitors, etc.

1) Set a chip parts replacing tool onto the chip parts to hold it down.
2) Unsolder at a side of the chip parts.

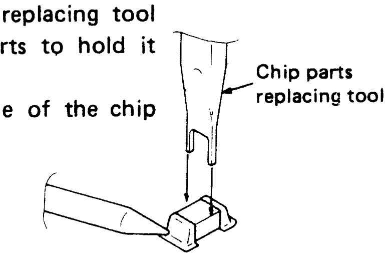

Chip parts
replacing tool

**Fig. 3-2-3** R/C removal-1

3) Remove the chip parts by twisting and sliding it.

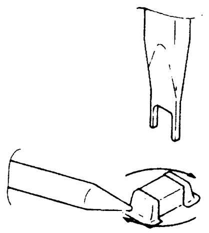


**Fig. 3-2-4** R/C removal-2

#### 3. How to remove transistors, diode.

1) Unsolder at the one-lead side of the chip parts.

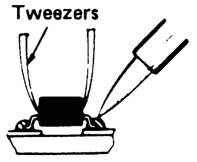


**Fig. 3-2-5** Tr/Diode removal-1

2) Lift the unsoldered side upwards.

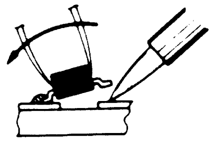


**Fig. 3-2-6** Tr/Diode removal-2

3) Heat the other two leads simultaneously and remove the chip parts upwards.

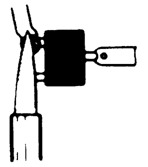


**Fig. 3-2-7** Tr/Diode removal-3

#### 4. Preheating and soldering

When setting new chip parts, especially capacitors, but except transistors, preheat them with hot air (150°C approx.) by use of a blower type of hair dryer for about 2 minutes just before soldering. For soldering, use a soldering iron of 30 watt approximately.

#### 5. How to set and solder chip parts

1) Presolder the contact points of the circuit pattern to which the chip parts will be soldered.

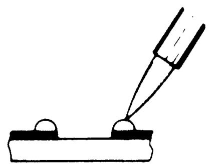


**Fig. 3-2-8** Soldering-1

2) Holding down the chip parts with the chip parts replacing tool, solder it with a soldering iron.

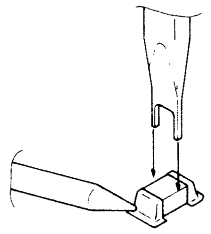
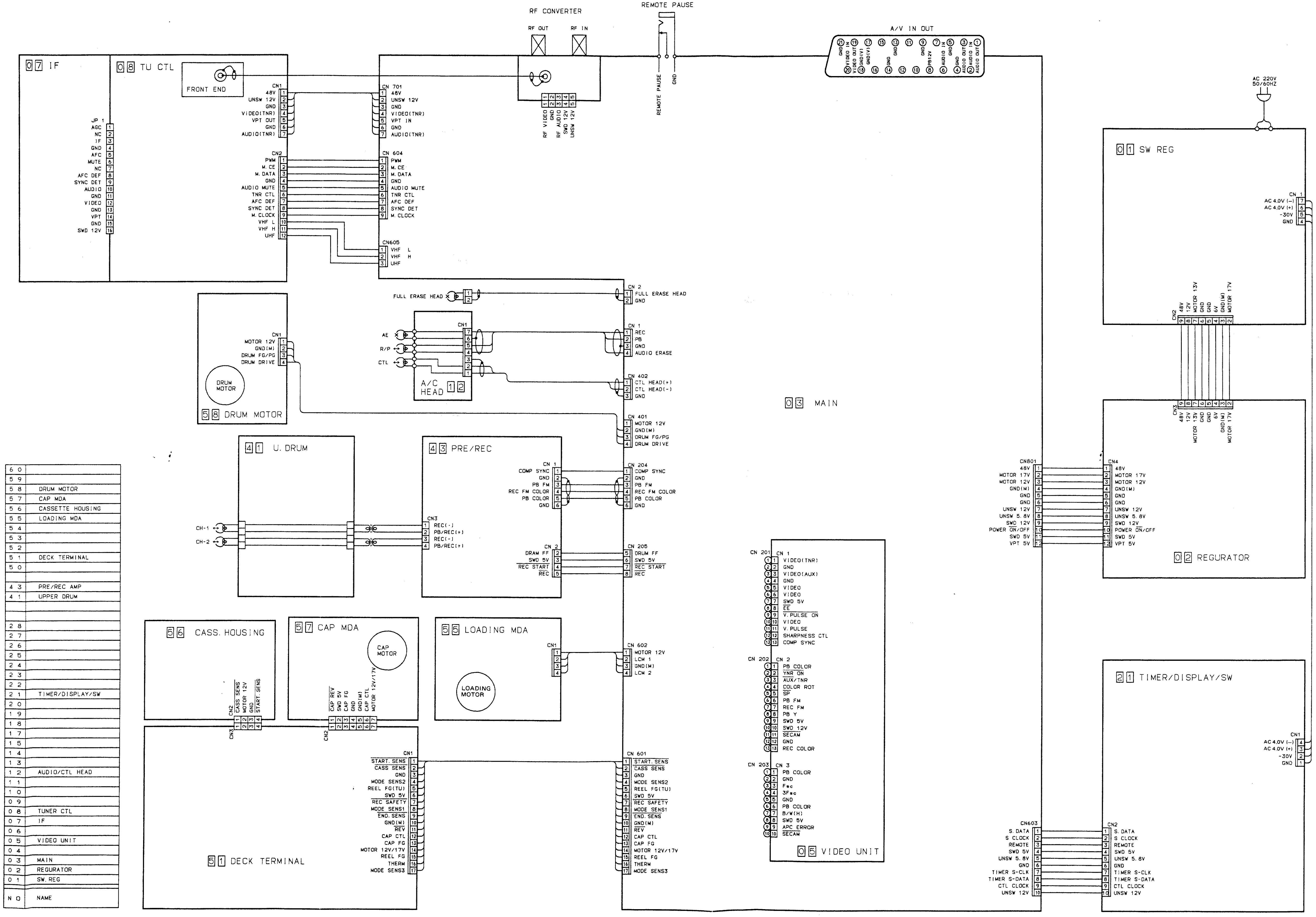


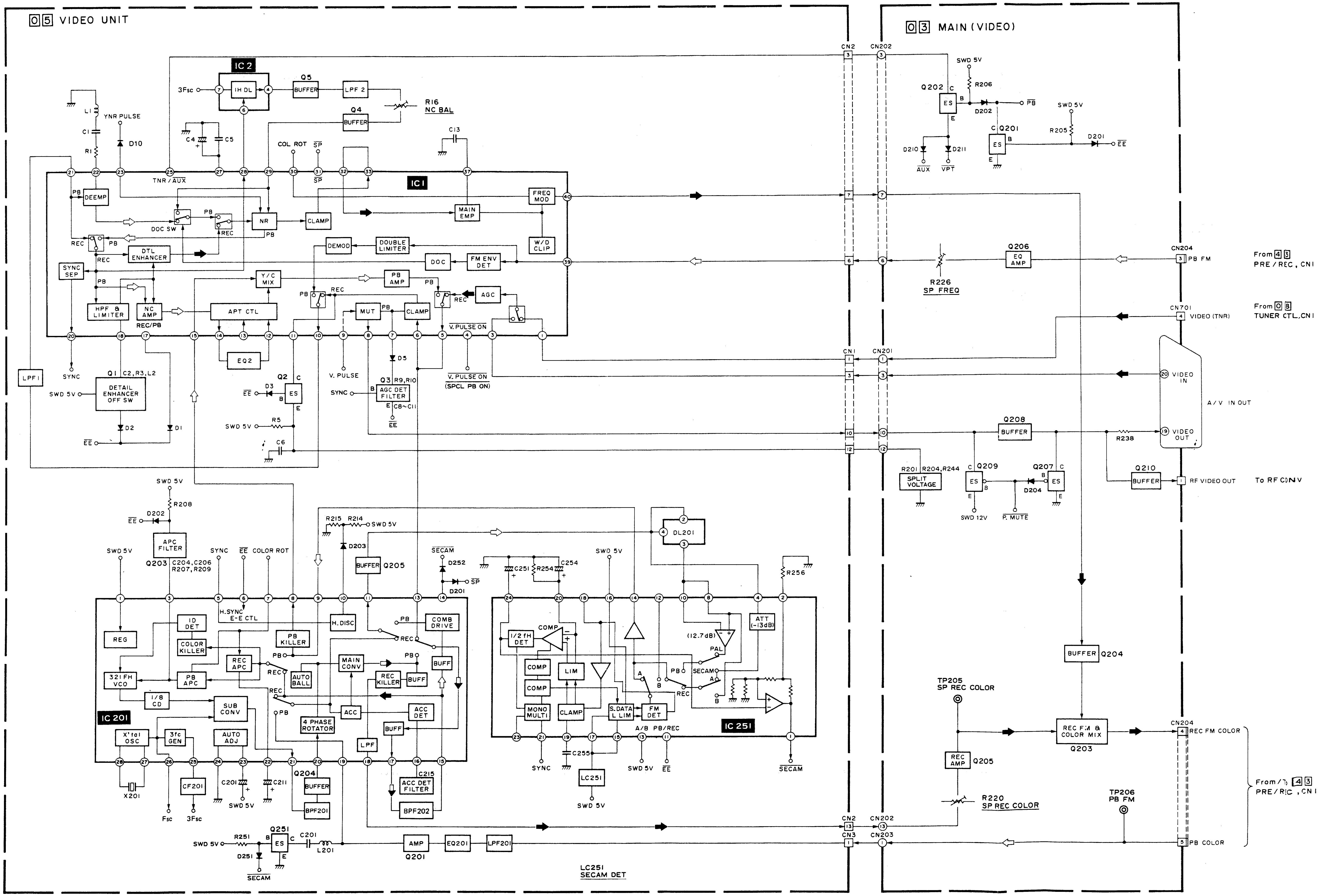
**Fig. 3-2-9** Soldering-2

## 3.3 BOARD INTERCONNECTIONS

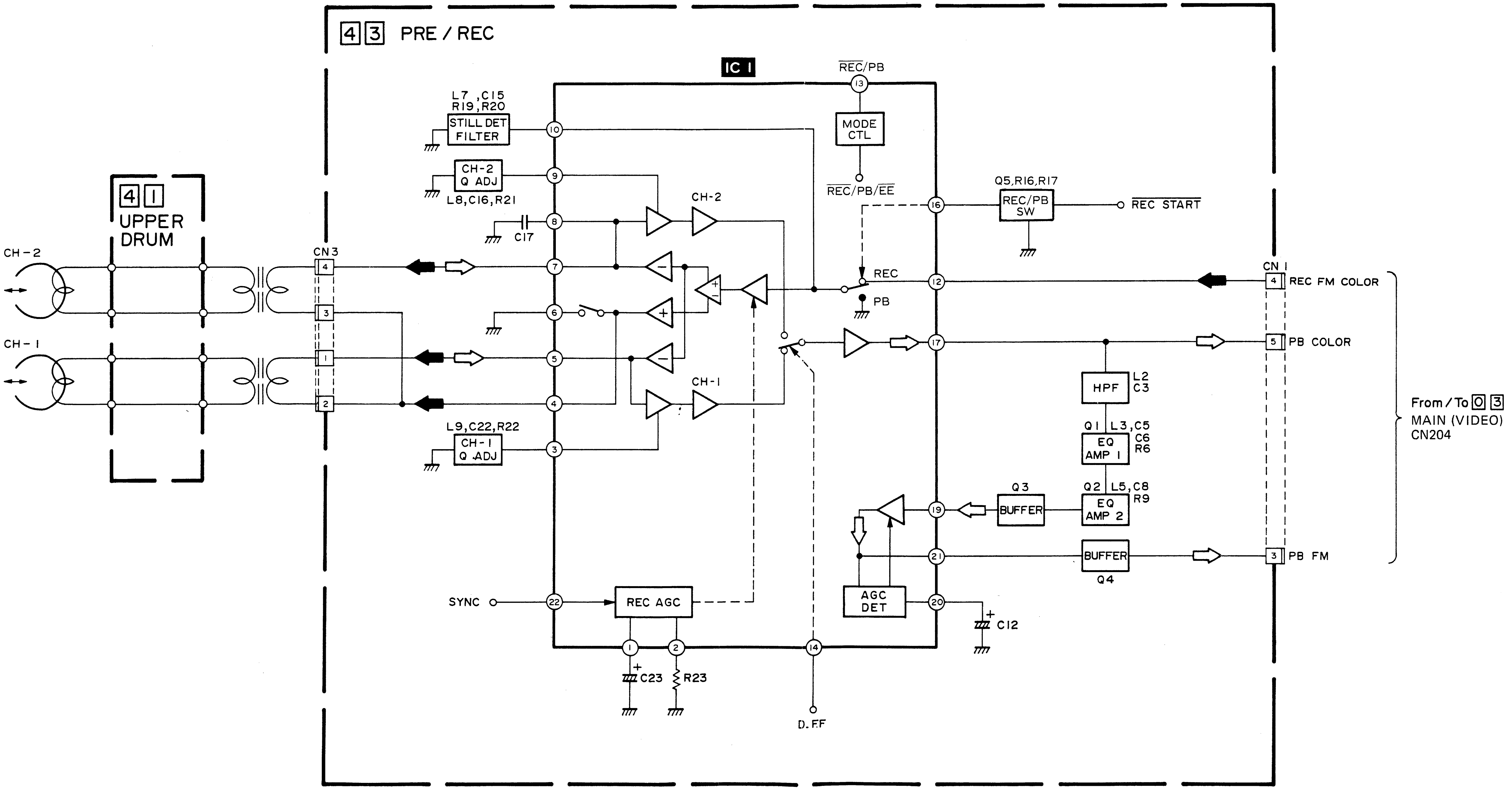

RF CONVERTER
RF OUT
RF IN
RF VIDEO
GND
RF AUDIO
SWD 12V
UNSW 12V
REMOTE PAUSE
GND
A/V IN OUT
AC 220V 50/60HZ
07 IF
JP 1
AGC
NC
IF
GND
AFC
MUTE
NC
AFC DEF
SYNC DET
AUDIO
GND
VIDEO
GND
VPT
GND
SWD 12V
08 TU CTL
FRONT END
CN1
48V
UNSW 12V
GND
VIDEO(TNR)
VPT OUT
GND
AUDIO(TNR)
CN2
PWM
M. CE
M. DATA
GND
AUDIO MUTE
TNR CTL
AFC DEF
SYNC DET
M. CLOCK
VHF L
VHF H
UHF
CN 701
VPT IN
CN 604
CN605
FULL ERASE HEAD
AE
R/P
CTL
A/C HEAD 12
58 DRUM MOTOR
MOTOR 12V
GND(M)
DRUM FG/PG
DRUM DRIVE
CN 2
CN 1
REC
PB
AUDIO ERASE
CN 402
CTL HEAD(+)
CTL HEAD(-)
CN 401
03 MAIN
41 U. DRUM
CH-1
CH-2
43 PRE/REC
COMP SYNC
PB FM
REC FM COLOR
PB COLOR
CN3
REC(-)
PB/REC(+)
DRAM FF
SWD 5V
REC START
CN 204
CN 205
DRUM FF
56 CASS. HOUSING
CASS SENS
START SENS
57 CAP MDA
CAP MOTOR
CAP REV
CAP FG
CAP CTL
MOTOR 12V/17V
55 LOADING MDA
LOADING MOTOR
CN 602
LCM 1
LCM 2
51 DECK TERMINAL
MODE SENS2
REEL FG(TU)
REC SAFETY
MODE SENS1
END. SENS
REV
REEL FG
THERM
MODE SENS3
CN 601
05 VIDEO UNIT
CN 201
VIDEO(TNR)
VIDEO(AUX)
VIDEO
EE
V. PULSE ON
V. PULSE
SHARPNESS CTL
CN 202
YNR ON
AUX/TNR
COLOR ROT
SP
REC FM
PB Y
SECAM
REC COLOR
CN 203
Fsc
3Fsc
B/W(H)
APC ERROR
01 SW REG
AC 4.0V (-)
AC 4.0V (+)
-30V
MOTOR 13V
6V
MOTOR 17V
02 REGURATOR
CN801
CN4
UNSW 5.8V
POWER ON/OFF
VPT 5V
21 TIMER/DISPLAY/SW
CN603
S. DATA
S CLOCK
REMOTE
TIMER S-CLK
TIMER S-DATA
CTL CLOCK

| N O | NAME |
|---|---|
| 6 0 | |
| 5 9 | |
| 5 8 | DRUM MOTOR |
| 5 7 | CAP MDA |
| 5 6 | CASSETTE HOUSING |
| 5 5 | LOADING MDA |
| 5 4 | |
| 5 3 | |
| 5 2 | |
| 5 1 | DECK TERMINAL |
| 5 0 | |
| | |
| 4 3 | PRE/REC AMP |
| 4 1 | UPPER DRUM |
| | |
| | |
| 2 8 | |
| 2 7 | |
| 2 6 | |
| 2 5 | |
| 2 4 | |
| 2 3 | |
| 2 2 | |
| 2 1 | TIMER/DISPLAY/SW |
| 2 0 | |
| 1 9 | |
| 1 8 | |
| 1 7 | |
| 1 5 | |
| 1 4 | |
| 1 3 | |
| 1 2 | AUDIO/CTL HEAD |
| 1 1 | |
| 1 0 | |
| 0 9 | |
| 0 8 | TUNER CTL |
| 0 7 | IF |
| 0 6 | |
| 0 5 | VIDEO UNIT |
| 0 4 | |
| 0 3 | MAIN |
| 0 2 | REGURATOR |
| 0 1 | SW. REG |

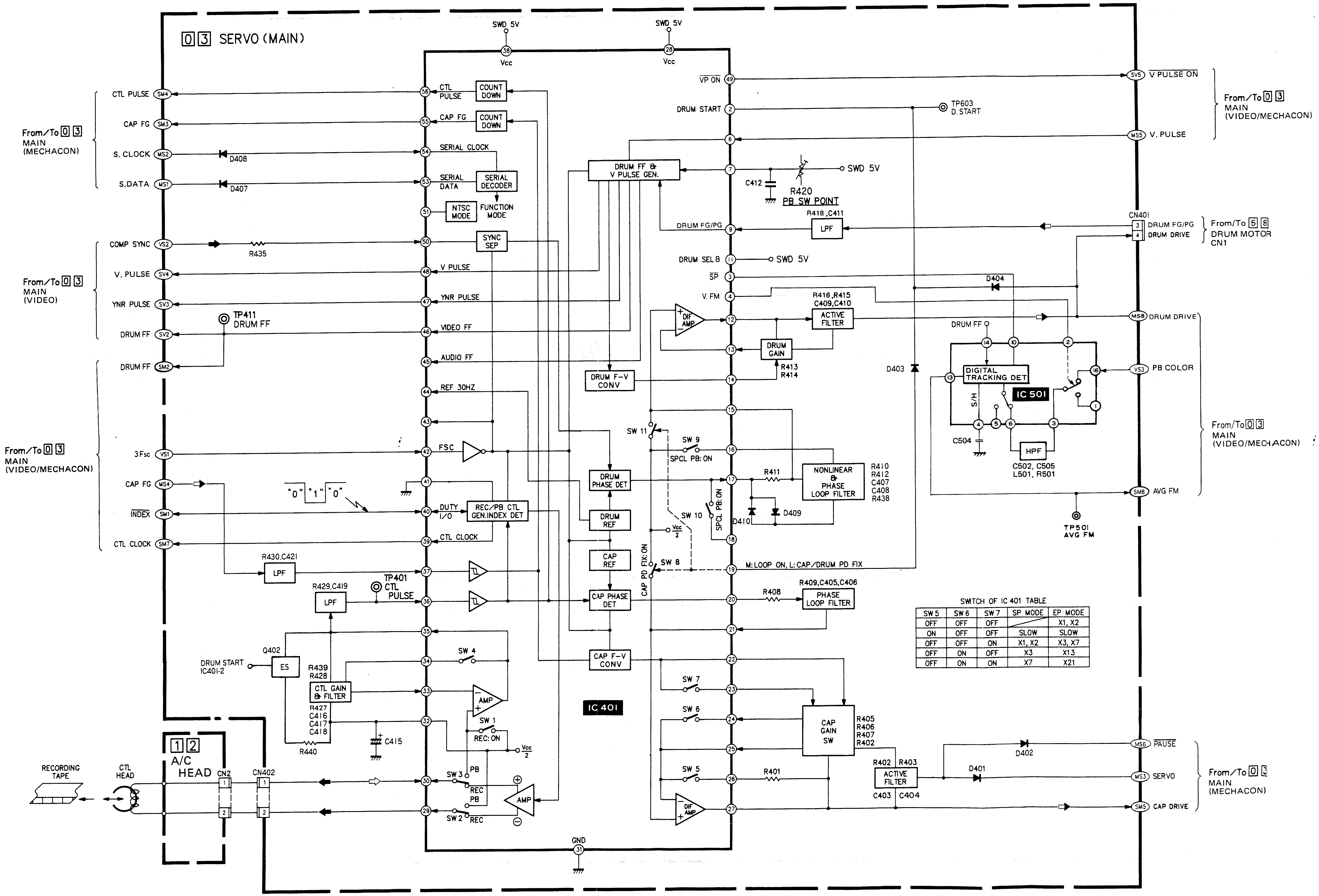
## 3.4 VIDEO BLOCK DIAGRAM


05 VIDEO UNIT
03 MAIN (VIDEO)
IC 2
1H DL
3Fsc
Q5
BUFFER
LPF 2
Q4
BUFFER
R16
NC BAL
C13
L1
C1
R1
YNR PULSE
D10
C4
C5
COL ROT
SP
TNR / AUX
IC1
PB
DEEMP
DOC SW
REC
NR
CLAMP
MAIN EMP
FREQ MOD
W/D CLIP
DTL ENHANCER
DEMOD
DOUBLE LIMITER
DOC
FM ENV DET
SYNC SEP
Y/C MIX
PB AMP
AGC
HPF & LIMITER
NC AMP
REC/PB
APT CTL
MUT
CLAMP
V. PULSE ON
EQ2
LPF1
SYNC
Q1 C2, R3, L2
DETAIL ENHANCER OFF SW
SWD 5V
D2
D1
EE
Q2
D3
ES
R5
C6
V. PULSE
D5
Q3 R9, R10
AGC DET FILTER
C8~C11
V. PULSE ON (SPCL PB ON)
CN2
CN202
CN1
CN201
CN3
CN203
Q202
R206
D202
PB
Q201
R205
D201
D210
D211
AUX
VPT
Q206
EQ AMP
R226
SP FREQ
CN204
PB FM
From 43 PRE/REC, CN1
CN701
VIDEO (TNR)
From 08 TUNER CTL, CN1
VIDEO IN
A/V IN OUT
Q208
BUFFER
R238
VIDEO OUT
R201 R204, R244
SPLIT VOLTAGE
Q209
Q207
D204
SWD 12V
P. MUTE
Q210
BUFFER
RF VIDEO OUT
To RF CONV
R208
D202
APC FILTER
Q203 C204, C206 R207, R209
H.SYNC E-E CTL
R215 R214
D203
BUFFER Q205
SECAM
D252
D201
DL201
C251
R254
C254
R256
REG
ID DET
COLOR KILLER
PB KILLER
H. DISC
COMB DRIVE
321 FH VCO
REC APC
PB APC
AUTO BALL
MAIN CONV
REC KILLER
BUFF
1/8 CD
SUB CONV
ACC
ACC DET
4 PHASE ROTATOR
LPF
IC 201
X'tal OSC
3fc GEN
AUTO ADJ
X201
CF201
C201
C211
Fsc
3Fsc
Q204
BUFFER
BPF201
C215
ACC DET FILTER
BPF202
1/2 fH DET
COMP
LIM
MONO MULTI
CLAMP
S. DATA L LIM
FM DET
(12.7dB)
PAL
ATT (-13dB)
IC 251
A/B PB/REC
C255
LC251
Q251
R251
D251
C201
L201
AMP
Q201
EQ201
LPF201
LC251 SECAM DET
BUFFER Q204
TP205 SP REC COLOR
REC AMP Q205
R220 SP REC COLOR
REC FM & COLOR MIX
Q203
TP206 PB FM
REC FM COLOR
PB COLOR

## 3.5 PRE/REC BLOCK DIAGRAM


4 3 PRE / REC
IC 1
4 1 UPPER DRUM
CH - 2
CH - 1
CN3
L7 ,C15
R19,R20
STILL DET FILTER
CH-2 Q ADJ
L8,C16,R21
C17
CH-2
CH-1
L9,C22,R22
CH-1 Q ADJ
SYNC
REC AGC
C23
R23
D.FF
$\overline{REC}$/PB
MODE CTL
$\overline{REC}$/PB/$\overline{EE}$
REC
PB
AGC DET
C12
Q5,R16,R17
REC/PB SW
$\overline{REC\ START}$
HPF
L2
C3
Q1
L3,C5
C6
R6
EQ AMP 1
Q2
L5,C8
R9
EQ AMP 2
Q3
BUFFER
BUFFER
Q4
CN 1
REC FM COLOR
PB COLOR
PB FM
From / To 0 3
MAIN (VIDEO)
CN204

## 3.6 SERVO BLOCK DIAGRAM


03 SERVO (MAIN)
From/To 03 MAIN (MECHACON)
From/To 03 MAIN (VIDEO)
From/To 03 MAIN (VIDEO/MECHACON)
CTL PULSE SM4
CAP FG SM3
S. CLOCK MS2
S.DATA MS1
D408
D407
COMP SYNC VS2
R435
V. PULSE SV4
YNR PULSE SV3
DRUM FF SV2
TP411 DRUM FF
DRUM FF SM2
3Fsc VS1
CAP FG MS4
INDEX SM1
CTL CLOCK SM7
"0" "1" "0"
R430,C421
LPF
R429,C419
TP401 CTL PULSE
DRUM START IC401-2
Q402
ES
R439
R428
CTL GAIN & FILTER
R427
C416
C417
C418
R440
C415
RECORDING TAPE
CTL HEAD
12 A/C HEAD
CN2
CN402
SWD 5V
Vcc
CTL PULSE
COUNT DOWN
CAP FG
SERIAL CLOCK
SERIAL DATA
SERIAL DECODER
NTSC MODE
FUNCTION MODE
SYNC SEP
V PULSE
YNR PULSE
VIDEO FF
AUDIO FF
REF 30HZ
FSC
DUTY I/O
REC/PB CTL GEN.INDEX DET
CTL CLOCK
SW 4
AMP
SW 1
REC: ON
Vcc/2
SW 3
PB
REC
SW 2
IC 401
DRUM FF & V PULSE GEN.
DRUM F-V CONV
DRUM PHASE DET
DRUM REF
CAP REF
CAP PHASE DET
CAP F-V CONV
GND
VP ON
DRUM START
DRUM FG/PG
DRUM SEL B
SP
V. FM
C412
R420 PB SW POINT
R418,C411
R416,R415 C409,C410
ACTIVE FILTER
DIF AMP
DRUM GAIN
R413
R414
SW 11
SW 9
SPCL PB: ON
SW 10
SPCL PB: ON
SW 8
CAP PD FIX: ON
R411
NONLINEAR & PHASE LOOP FILTER
R410 R412 C407 C408 R438
D410
D409
M: LOOP ON, L: CAP/DRUM PD FIX
R408
R409,C405,C406
PHASE LOOP FILTER
SW 7
SW 6
SW 5
R401
CAP GAIN SW
R405 R406 R407 R402
R402 R403
ACTIVE FILTER
C403 C404
D401
D402
TP603 D. START
D404
D403
DRUM FF
DIGITAL TRACKING DET
IC 501
S/H
C504
HPF
C502, C505 L501, R501
TP501 AVG FM
CN401
SV5 V PULSE ON
MS5 V. PULSE
From/To 03 MAIN (VIDEO/MECHACON)
DRUM FG/PG
DRUM DRIVE
From/To 58 DRUM MOTOR CN1
MS8 DRUM DRIVE
VS3 PB COLOR
SM8 AVG FM
From/To 03 MAIN (VIDEO/MECHACON)
MS6 PAUSE
MS3 SERVO
SM5 CAP DRIVE
From/To 03 MAIN (MECHACON)

SWITCH OF IC 401 TABLE

| SW 5 | SW 6 | SW 7 | SP MODE | EP MODE |
|---|---|---|---|---|
| OFF | OFF | OFF |  | X1, X2 |
| ON | OFF | OFF | SLOW | SLOW |
| OFF | OFF | ON | X1, X2 | X3, X7 |
| OFF | ON | OFF | X3 | X13 |
| OFF | ON | ON | X7 | X21 |

6

5

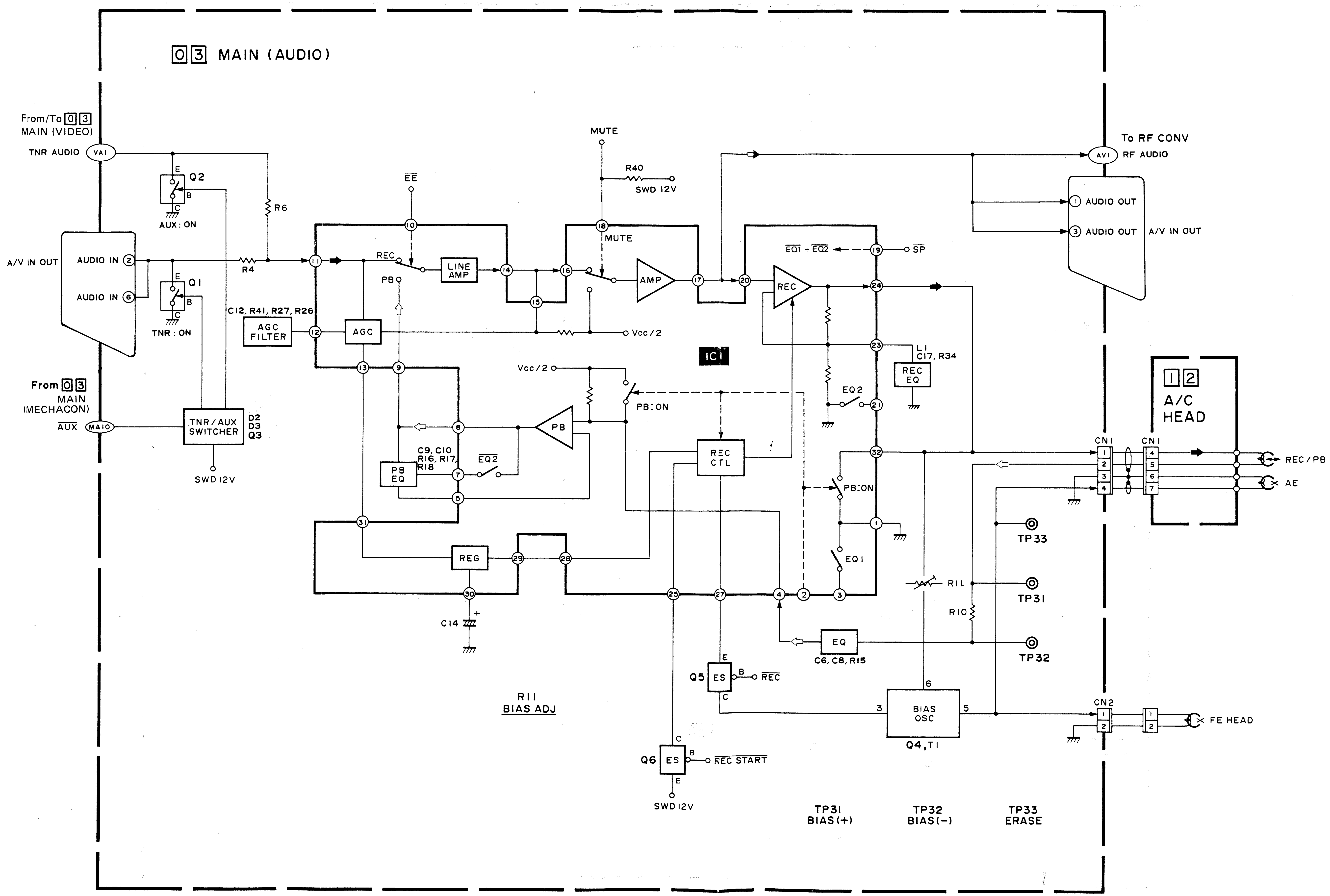
4

3

2

1

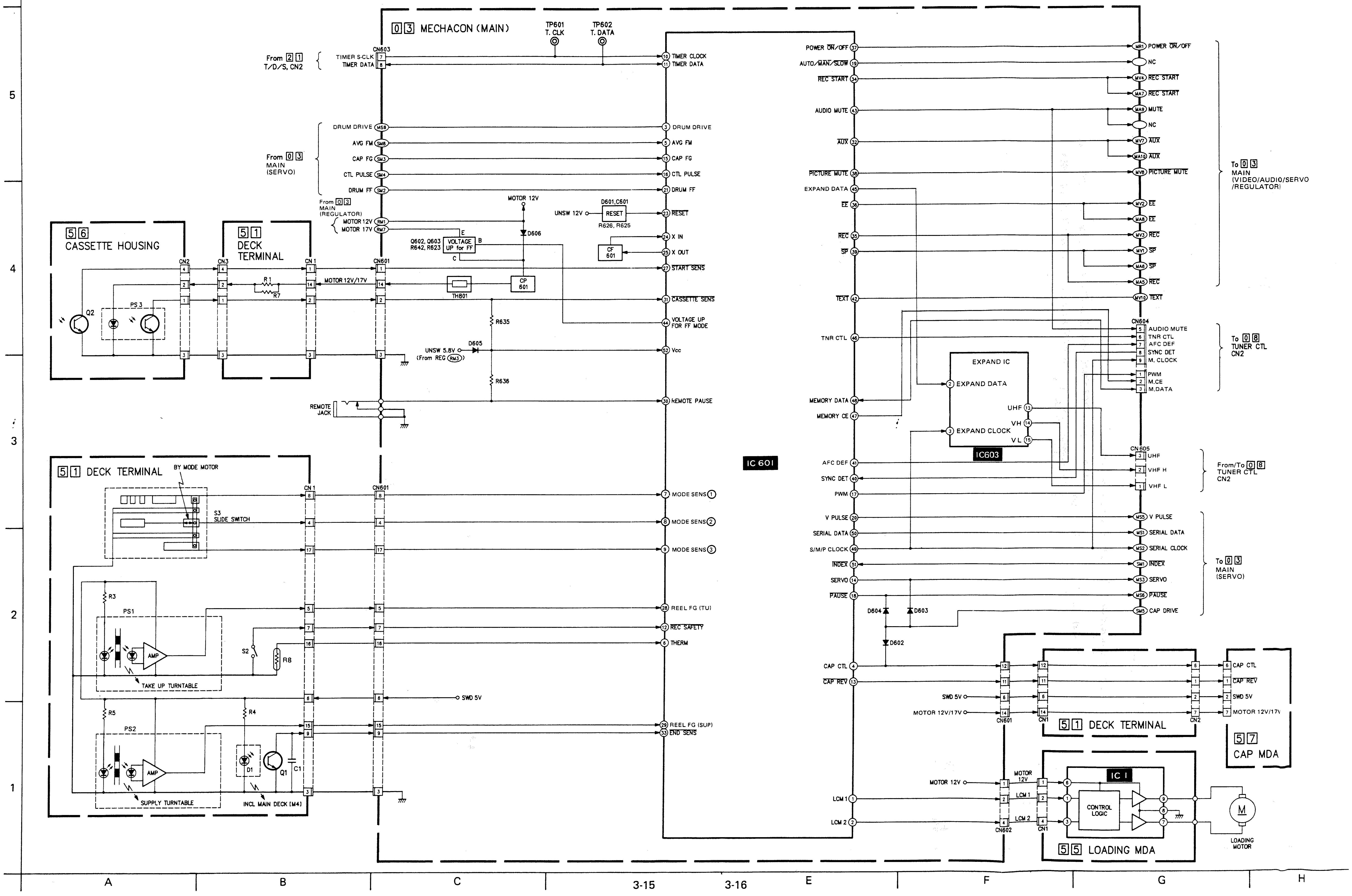
## 3.7 AUDIO BLOCK DIAGRAM



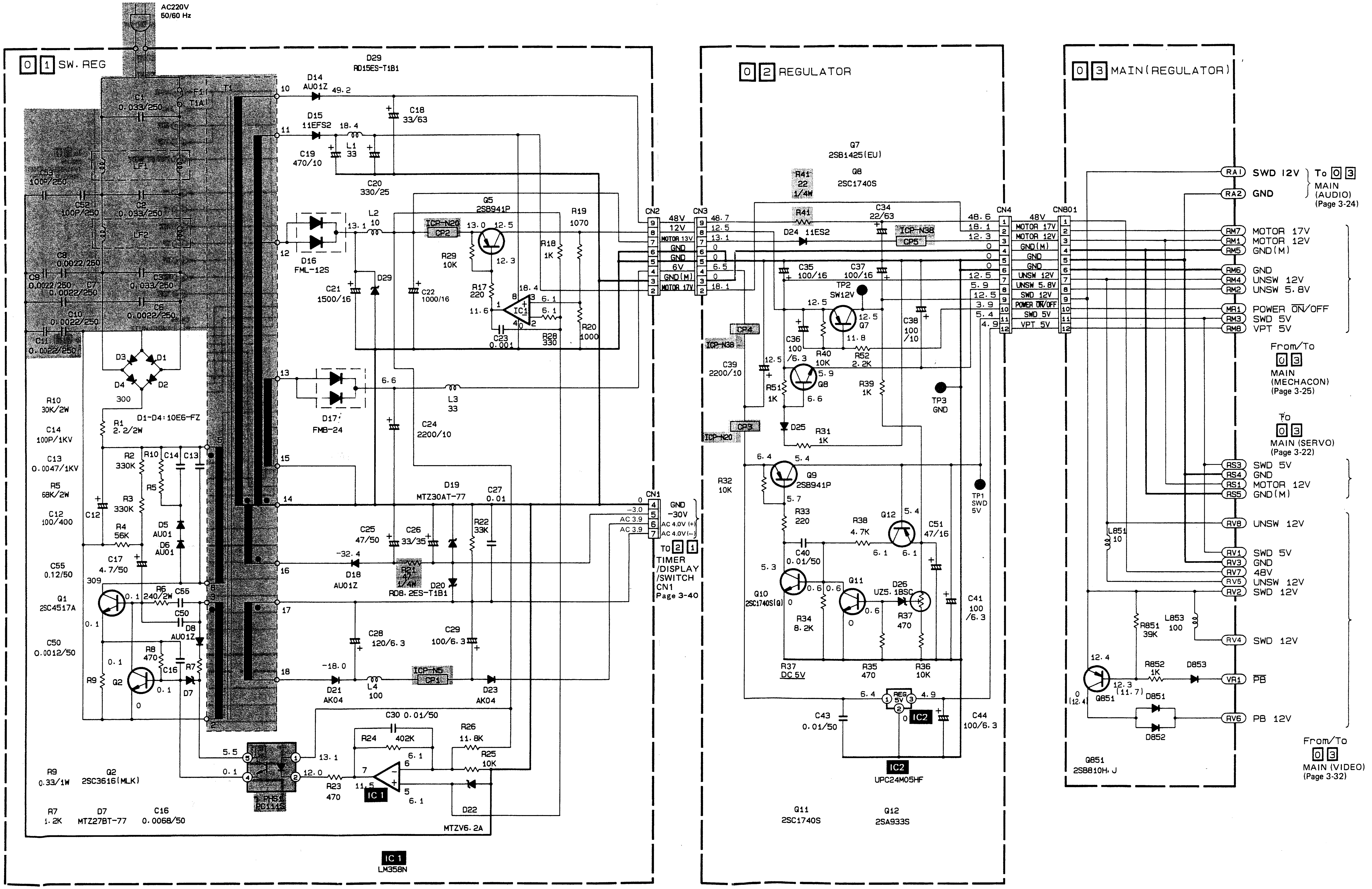
03 MAIN (AUDIO)
From/To 03 MAIN (VIDEO)
TNR AUDIO
VA1
Q2
E
B
C
AUX : ON
R6
A/V IN OUT
AUDIO IN 2
AUDIO IN 6
Q1
TNR : ON
R4
From 03 MAIN (MECHACON)
AUX
MA10
TNR/AUX SWITCHER
D2
D3
Q3
SWD 12V
C12, R41, R27, R26
AGC FILTER
AGC
EE
REC
PB
LINE AMP
MUTE
R40
SWD 12V
MUTE
AMP
Vcc/2
IC1
EQ1 + EQ2
SP
REC
L1
C17, R34
REC EQ
EQ2
Vcc/2
PB:ON
PB
C9, C10
R16, R17,
R18
EQ2
PB EQ
REC CTL
PB:ON
EQ1
REG
C14
R11 BIAS ADJ
Q5
ES
REC
Q6
ES
REC START
SWD 12V
EQ
C6, C8, R15
R11
R10
BIAS OSC
Q4, T1
To RF CONV
AV1
RF AUDIO
1 AUDIO OUT
3 AUDIO OUT
A/V IN OUT
12 A/C HEAD
CN1
REC/PB
AE
TP33
TP31
TP32
CN2
FE HEAD
TP31 BIAS(+)
TP32 BIAS(−)
TP33 ERASE

A B C E F G H

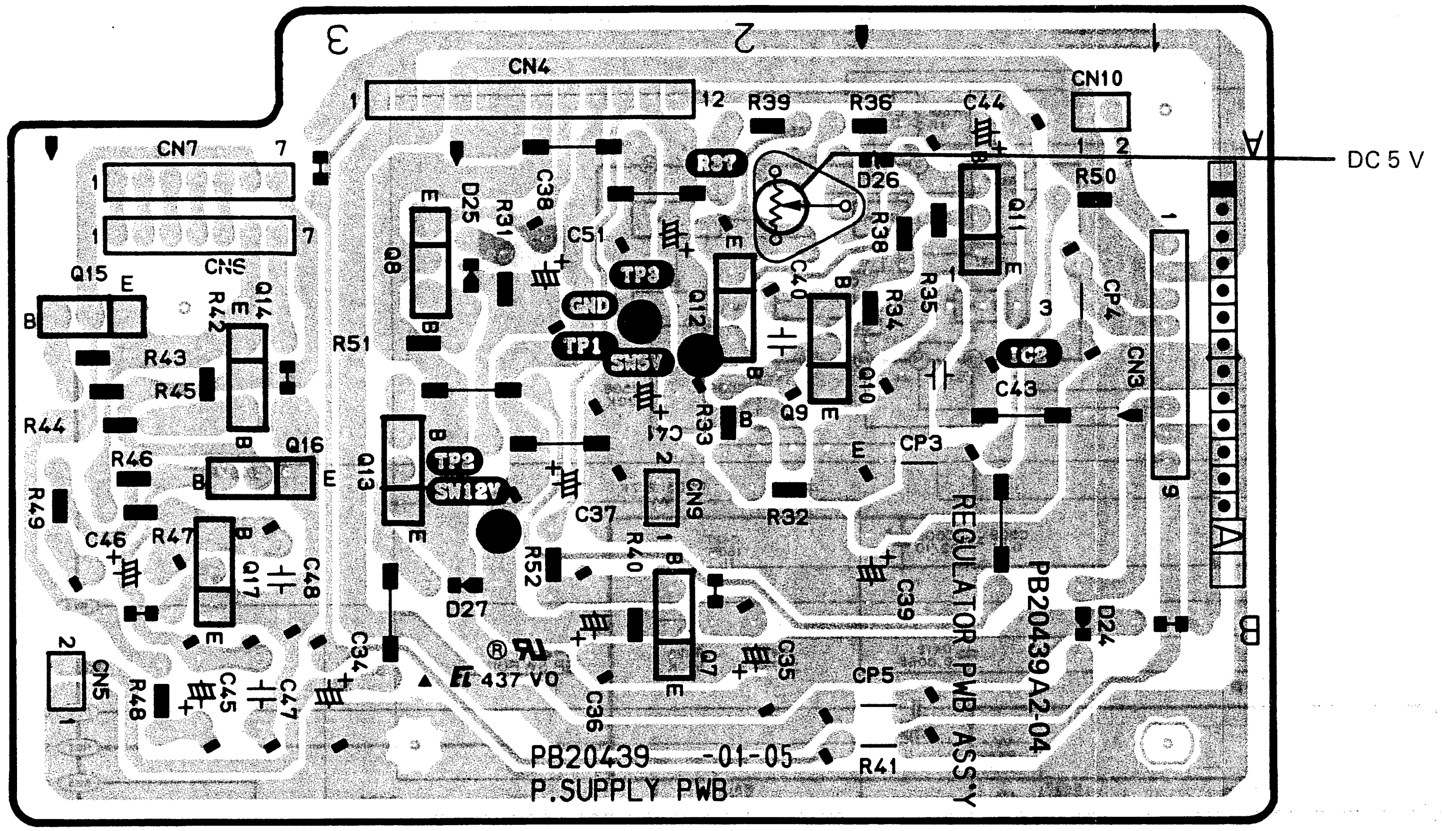
## 3.8 SYSTEM CTL BLOCK DIAGRAM

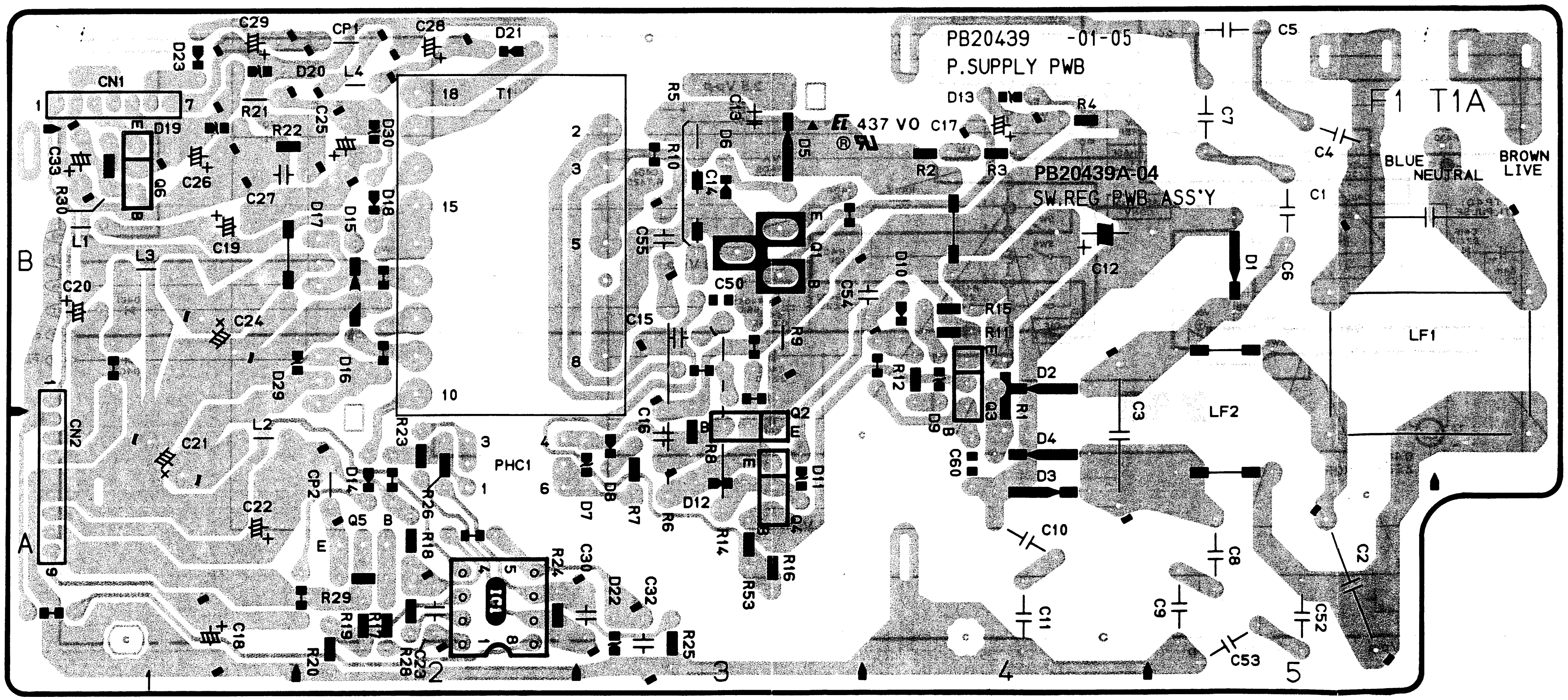

0 3 MECHACON (MAIN)
TP601
T. CLK
TP602
T. DATA
From 2 1
T/D/S, CN2
CN603
TIMER S-CLK 7
TIMER DATA 8
10 TIMER CLOCK
11 TIMER DATA
From 0 3
MAIN
(SERVO)
DRUM DRIVE MS8
AVG FM SM8
CAP FG SM3
CTL PULSE SM4
DRUM FF SM2
3 DRUM DRIVE
5 AVG FM
15 CAP FG
16 CTL PULSE
21 DRUM FF
From 0 3
MAIN
(REGULATOR)
MOTOR 12V RM1
MOTOR 17V RM7
MOTOR 12V
D606
Q602, Q603
R642, R623
VOLTAGE UP for FF
E
B
C
UNSW 12V
D601,C601
RESET
R626, R625
23 RESET
24 X IN
CF 601
25 X OUT
5 6
CASSETTE HOUSING
Q2
PS3
CN2
5 1
DECK TERMINAL
CN3
R1
R7
CN 1
MOTOR 12V/17V
CN601
TH801
CP 601
27 START SENS
31 CASSETTE SENS
44 VOLTAGE UP FOR FF MODE
R635
D605
UNSW 5.8V
(From REG RM3)
52 Vcc
R636
REMOTE JACK
30 REMOTE PAUSE
5 1 DECK TERMINAL
BY MODE MOTOR
S3
SLIDE SWITCH
CN 1
CN601
7 MODE SENS①
8 MODE SENS②
9 MODE SENS③
R3
PS1
AMP
TAKE UP TURNTABLE
S2
R8
28 REEL FG (TU)
12 REC SAFETY
6 THERM
SWD 5V
R5
PS2
R4
AMP
D1
Q1
C1
SUPPLY TURNTABLE
INCL MAIN DECK [M4]
29 REEL FG (SUP)
33 END SENS
IC 601
POWER ON/OFF 37
AUTO/MAN/SLOW 19
REC START 34
AUDIO MUTE 43
AUX 32
PICTURE MUTE 38
EXPAND DATA 45
EE 36
REC 35
SP 39
TEXT 42
TNR CTL 46
MEMORY DATA 48
MEMORY CE 47
AFC DEF 41
SYNC DET 40
PWM 17
V PULSE 20
SERIAL DATA 50
S/M/P CLOCK 49
INDEX 51
SERVO 14
PAUSE 18
D604
D603
D602
CAP CTL 4
CAP REV 13
LCM 1 1
LCM 2 2
MR1 POWER ON/OFF
NC
MV4 REC START
MA7 REC START
MA9 MUTE
NC
MV7 AUX
MA10 AUX
MV8 PICTURE MUTE
MV2 EE
MA8 EE
MV3 REC
MV1 SP
MA6 SP
MA5 REC
MV10 TEXT
To 0 3
MAIN
(VIDEO/AUDIO/SERVO
/REGULATOR)
CN604
5 AUDIO MUTE
6 TNR CTL
7 AFC DEF
8 SYNC DET
9 M. CLOCK
1 PWM
2 M.CE
3 M.DATA
To 0 8
TUNER CTL
CN2
EXPAND IC
2 EXPAND DATA
3 EXPAND CLOCK
UHF 13
VH 14
VL 15
IC603
CN605
3 UHF
2 VHF H
1 VHF L
From/To 0 8
TUNER CTL
CN2
MS5 V PULSE
MS1 SERIAL DATA
MS2 SERIAL CLOCK
SM1 INDEX
MS3 SERVO
MS6 PAUSE
SM5 CAP DRIVE
To 0 3
MAIN
(SERVO)
SWD 5V
MOTOR 12V/17V
CN601
CN1
5 1 DECK TERMINAL
CN2
6 CAP CTL
1 CAP REV
2 SWD 5V
7 MOTOR 12V/17V
5 7
CAP MDA
MOTOR 12V
MOTOR 12V
LCM 1
LCM 2
CN602
CN1
IC 1
CONTROL LOGIC
M
LOADING MOTOR
5 5 LOADING MDA
1
2
3
4
5
6
A
B
C
E
F
G
H

## 3.9 POWER TRANS, POWER TRANSISTOR & REGULATOR (MAIN) SCHEMATIC DIAGRAM

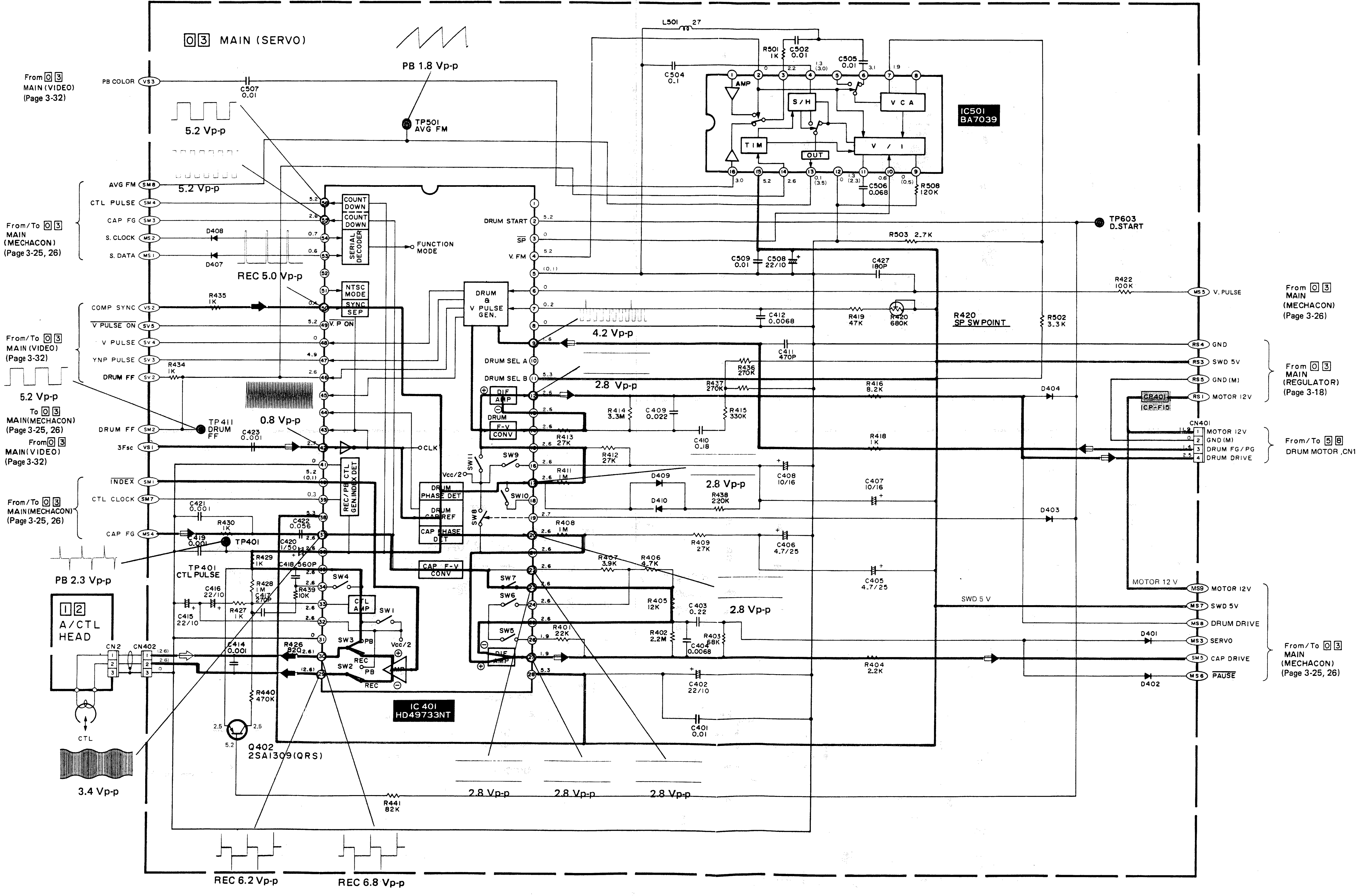

AC220V
50/60 Hz
01 SW. REG
02 REGULATOR
03 MAIN (REGULATOR)
F1
T1A
T1
C1 0.033/250
LF1
LF2
C53 100P/250
C52 100P/250
C2 0.033/250
C8 0.0022/250
C9 0.0022/250
C7 0.0022/250
C3 0.033/250
C6 0.0022/250
C10 0.0022/250
C11 0.0022/250
D1 D2 D3 D4
D1-D4: 10E6-FZ
R10 30K/2W
C14 100P/1KV
C13 0.0047/1KV
R5 68K/2W
C12 100/400
C55 0.12/50
Q1 2SC4517A
C50 0.0012/50
R9 0.33/1W
Q2 2SC3616(MLK)
R7 1.2K
D7 MTZ27BT-77
C16 0.0068/50
R1 2.2/2W
R2 330K
R3 330K
R4 56K
D5 AU01
D6 AU01
C17 4.7/50
R6 240/2W
C50
D8 AU01Z
R8 470
PHS1 PC111S
D29 RD15ES-T1B1
D14 AU01Z
49.2
D15 11EFS2
18.4
L1 33
C18 33/63
C19 470/10
C20 330/25
D16 FML-12S
13.1
L2 10
ICP-N20 CP2
Q5 2SB941P
13.0 12.5 12.3
R29 10K
R17 220
C21 1500/16
C22 1000/16
R18 1K
R19 1070
R20 1000
R28 330
C23 0.001
IC1
D17 FMB-24
6.6
L3 33
C24 2200/10
D19 MTZ30AT-77
C27 0.01
C25 47/50
C26 33/35
R22 33K
D18 AU01Z
-32.4
R21 47 1/4W
D20 RD8.2ES-T1B1
C28 120/6.3
C29 100/6.3
-18.0
D21 AK04
L4 100
ICP-N5 CP1
D23 AK04
C30 0.01/50
R24 402K
R26 11.8K
R25 10K
R23 470
D22 MTZV6.2A
IC1 LM358N
CN1
GND -30V AC 4.0V(+) AC 4.0V(-)
-3.0 AC 3.9 AC 3.9
TO 21 TIMER /DISPLAY /SWITCH CN1 Page 3-40
CN2 CN3 CN4 CN801
48V 12V MOTOR 13V GND GND GND 6V GND(M) MOTOR 17V
48.7 12.5 13.1 0 0 6.5 0 18.1
Q7 2SB1425(EU)
Q8 2SC1740S
R41 22 1/4W
D24 11ES2
C34 22/63
ICP-N38 CP5
CP4
ICP-N38
C35 100/16
C37 100/16
TP2 SW12V
C36 100/6.3
R40 10K
R52 2.2K
C38 100/10
C39 2200/10
R51 1K
R39 1K
TP3 GND
D25
R31 1K
CP3
ICP-N20
Q9 2SB941P
R32 10K
R33 220
R38 4.7K
Q12
C51 47/16
C40 0.01/50
Q10 2SC1740S(Q)
Q11
D26 UZ5.1BSC
R34 8.2K
R37 470
C41 100/6.3
R37 DC 5V
R35 470
R36 10K
TP1 SWD 5V
C43 0.01/50
REG 5V
IC2
C44 100/6.3
IC2 UPC24M05HF
Q11 2SC1740S
Q12 2SA933S
48.6 18.1 12.3 0 0 0 12.5 5.9 12.5 3.9 5.4 4.9
48V MOTOR 17V MOTOR 12V GND(M) GND GND UNSW 12V UNSW 5.8V SWD 12V POWER ON/OFF SWD 5V VPT 5V
RA1 SWD 12V
RA2 GND
To 03 MAIN (AUDIO) (Page 3-24)
RM7 MOTOR 17V
RM1 MOTOR 12V
RM5 GND(M)
RM6 GND
RM4 UNSW 12V
RM2 UNSW 5.8V
MR1 POWER ON/OFF
RM3 SWD 5V
RM8 VPT 5V
From/To 03 MAIN (MECHACON) (Page 3-25)
To 03 MAIN (SERVO) (Page 3-22)
RS3 SWD 5V
RS4 GND
RS1 MOTOR 12V
RS5 GND(M)
RV8 UNSW 12V
RV1 SWD 5V
RV3 GND
RV7 48V
RV5 UNSW 12V
RV2 SWD 12V
RV4 SWD 12V
VR1 PB
RV6 PB 12V
L851 10
R851 39K
L853 100
R852 1K
D853
Q851
D851
D852
Q851 2SB810H, J
From/To 03 MAIN (VIDEO) (Page 3-32)

## 3.10 SWITCHING REGULATOR CIRCUIT BOARD


DC 5 V
CN4
1
12
R39
R36
C44
CN10
1 2
CN7
CN5
Q15
Q14
R42
R43
R45
R44
R46
Q16
R49
C46
R47
Q17
C48
C34
R48
C45
C47
D25
R31
C38
C51
Q8
R37
D26
R38
Q11
R50
TP3
GND
TP1
SW5V
Q12
C40
R34
R35
Q10
Q9
IC2
C43
CN3
CP4
CP3
R51
Q13
TP2
SW12V
C37
CN9
R40
R52
D27
R32
C39
R33
C41
Q7
C35
C36
CP5
R41
D24
437 VO
PB20439 -01-05
P.SUPPLY PWB
REGULATOR PWB ASS'Y
PB20439A204
A
B
1
2
3

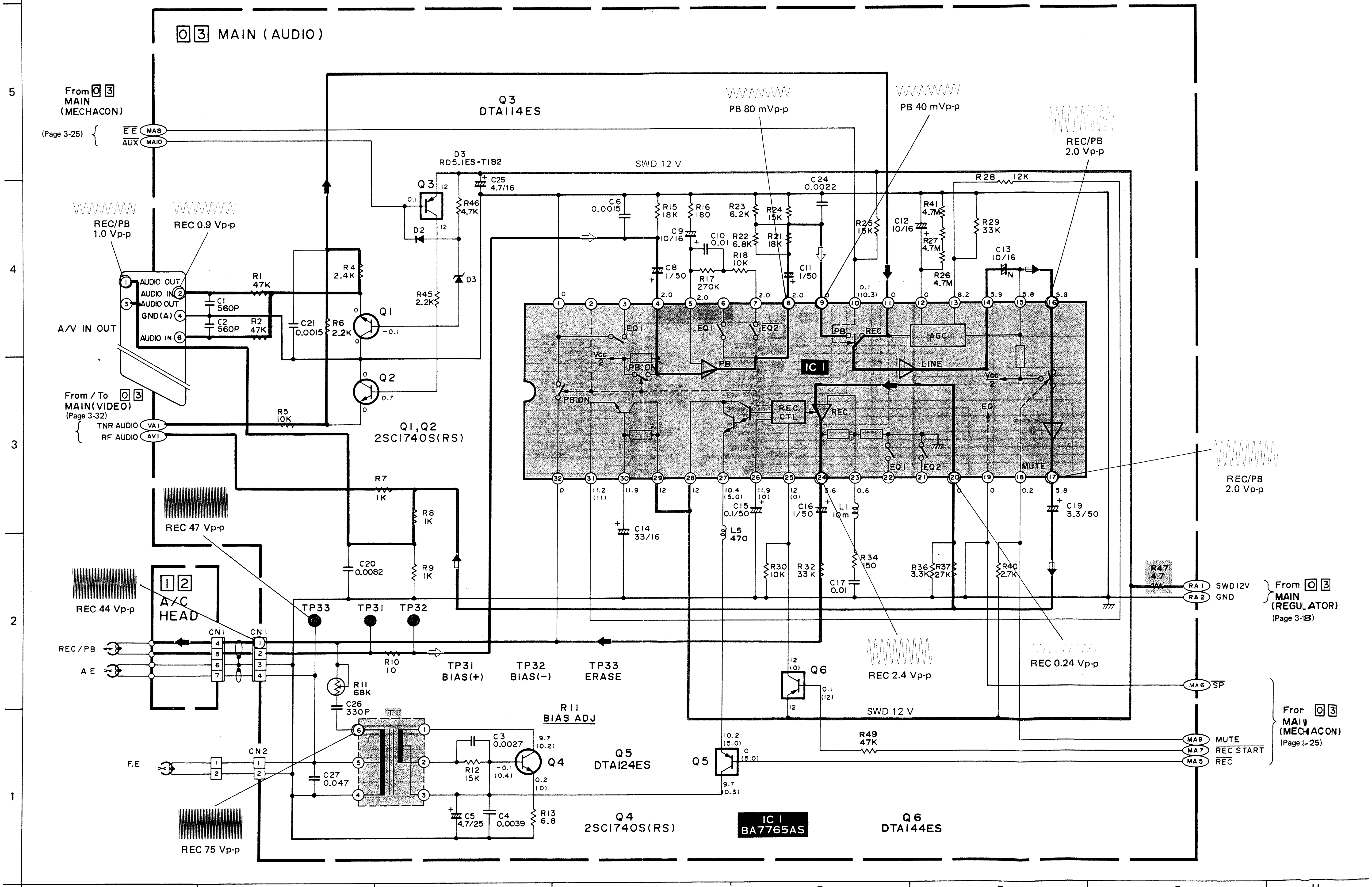

C29
CP1
C28
D21
D23
D20
L4
CN1
D19
R21
C25
D30
R22
C33
C26
Q6
R30
C27
D18
D15
D17
C19
L1
L3
B
C20
C24
D16
D29
CN2
A
C21
L2
C22
CP2
D14
Q5
R18
R26
R29
R19
R17
R20
C18
R28
C23
C30
IC1
R24
D22
C32
R25
T1
18
2
3
15
5
8
10
R23
PHC1
R5
C13
R10
D6
C14
D5
437 VO
C55
Q1
C50
C15
R9
C54
D10
C16
Q2
R8
D8
R7
D7
R6
D12
D11
Q4
R14
R53
R16
PB20439 -01-05
P.SUPPLY PWB
D13
R4
C17
R2
R3
PB20439A-04
SW.REG PWB ASS'Y
C12
D1
C6
R15
R11
R12
Q3
D9
C60
D2
R1
D4
D3
C3
LF2
C10
C8
C9
C11
C53
C52
C2
C5
C7
C4
F1 T1A
BLUE NEUTRAL
BROWN LIVE
C1
LF1
4
5

## 3.11 SERVO SCHEMATIC DIAGRAM



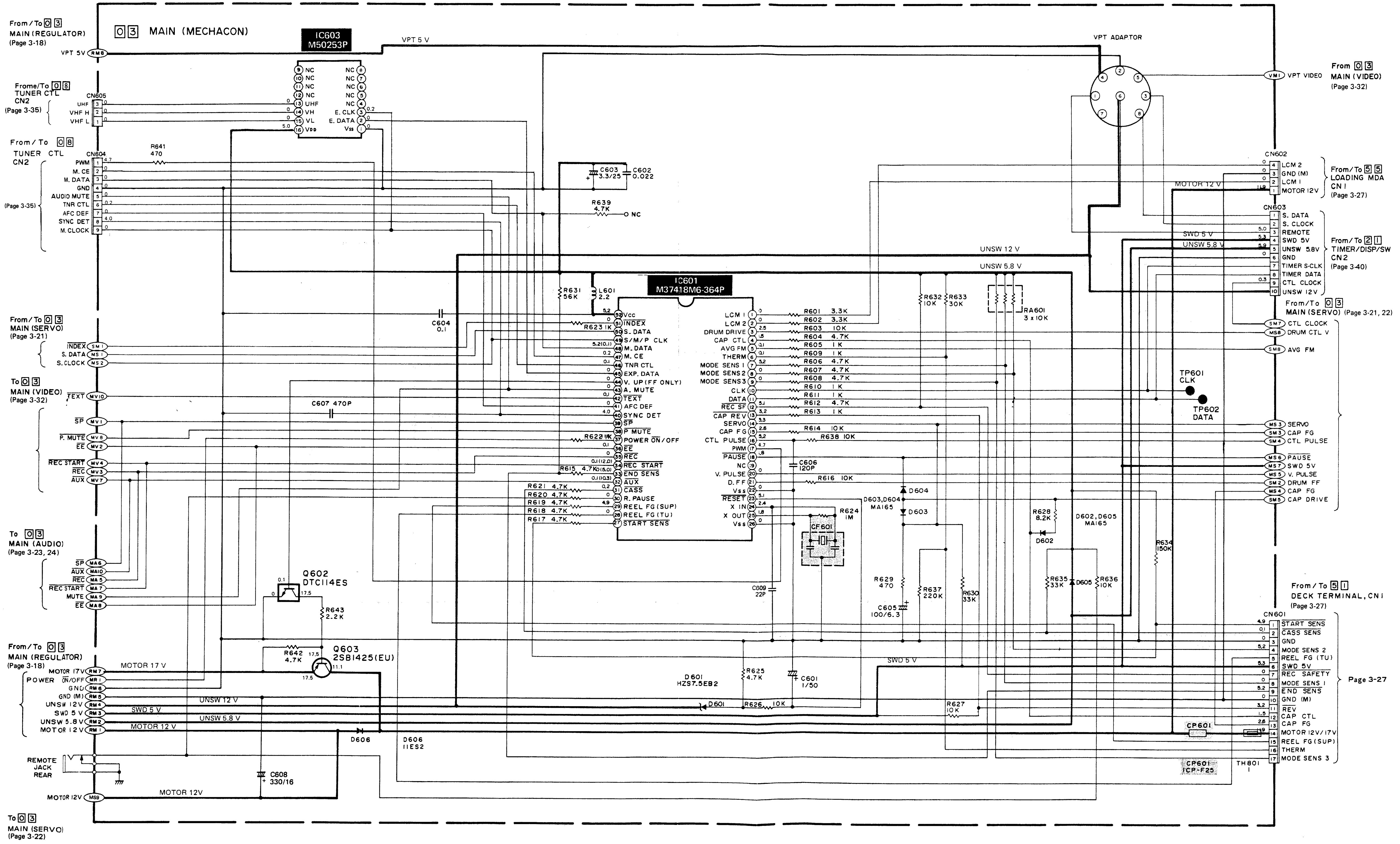
03 MAIN (SERVO)
From 03 MAIN (VIDEO) (Page 3-32)
PB COLOR VS3
C507 0.01
PB 1.8 Vp-p
TP501 AVG FM
5.2 Vp-p
5.2 Vp-p
From/To 03 MAIN (MECHACON) (Page 3-25, 26)
AVG FM SM8
CTL PULSE SM4
CAP FG SM3
S. CLOCK MS2
S. DATA MS1
D408
D407
REC 5.0 Vp-p
COUNT DOWN
COUNT DOWN
SERIAL DECODER
FUNCTION MODE
NTSC MODE
SYNC SEP
V. P ON
DRUM & V PULSE GEN.
DRUM START
SP
V. FM
From/To 03 MAIN (VIDEO) (Page 3-32)
COMP SYNC VS2
V PULSE ON SV5
V PULSE SV4
YNP PULSE SV3
DRUM FF SV2
R435 1K
R434 1K
5.2 Vp-p
To 03 MAIN(MECHACON) (Page 3-25, 26)
From 03 MAIN(VIDEO) (Page 3-32)
DRUM FF SM2
3Fsc VS1
TP411 DRUM FF
0.8 Vp-p
C423 0.001
CLK
From/To 03 MAIN(MECHACON) (Page 3-25, 26)
INDEX SM1
CTL CLOCK SM7
CAP FG MS4
C421 0.001
R430 1K
C419 0.001
TP401
PB 2.3 Vp-p
TP401 CTL PULSE
02 A/CTL HEAD
CN2
CN402
CTL
3.4 Vp-p
REC/PB CTL GEN INDEX DET
DRUM PHASE DET
DRUM CAP REF
CAP PHASE DET
CAP F-V CONV
DIF AMP
DRUM F-V CONV
CTL AMP
SW1 SW2 SW3 SW4 SW5 SW6 SW7 SW8 SW9 SW10 SW11
Vcc/2
REC PB
IC 401 HD49733NT
Q402 2SA1309(QRS)
R440 470K
R441 82K
R426 820
C414 0.001
R427 1K
C415 22/10
C416 22/10
R428 1M
C417 270P
R429 1K
C418 560P
R439 10K
C420 1/50
C422 0.056
REC 6.2 Vp-p
REC 6.8 Vp-p
4.2 Vp-p
2.8 Vp-p
2.8 Vp-p
2.8 Vp-p
2.8 Vp-p
2.8 Vp-p
2.8 Vp-p
DRUM SEL A
DRUM SEL B
R413 27K
R412 27K
R411 1M
R408 1M
R414 3.3M
C409 0.022
R437 270K
R436 270K
R415 330K
C410 0.18
D409
D410
R438 220K
C408 10/16
C407 10/16
R409 27K
C406 4.7/25
R407 3.9K
R406 4.7K
C405 4.7/25
R405 12K
C403 0.22
R401 22K
R402 2.2M
R403 68K
C404 0.0068
C402 22/10
C401 0.01
R404 2.2K
L501 27
R501 1K
C502 0.01
C505 0.01
C504 0.1
AMP
S/H
V C A
TIM
OUT
V / I
IC501 BA7039
C506 0.068
R508 120K
TP603 D.START
R503 2.7K
C509 0.01
C508 22/10
C427 180P
C412 0.0068
R419 47K
R420 680K
R420 SP SW POINT
R502 3.3K
C411 470P
R416 8.2K
R418 1K
R422 100K
D404
D403
D401
D402
From 03 MAIN (MECHACON) (Page 3-26)
MS5 V. PULSE
RS4 GND
RS3 SWD 5V
RS5 GND (M)
RS1 MOTOR 12V
From 03 MAIN (REGULATOR) (Page 3-18)
CP401 ICP-F15
CN401
1 MOTOR 12V
2 GND (M)
3 DRUM FG/PG
4 DRUM DRIVE
From/To 58 DRUM MOTOR, CN1
MOTOR 12 V
SWD 5 V
MS9 MOTOR 12V
MS7 SWD 5V
MS8 DRUM DRIVE
MS3 SERVO
MS5 CAP DRIVE
MS6 PAUSE
From/To 03 MAIN (MECHACON) (Page 3-25, 26)

## 3.12 AUDIO SCHEMATIC DIAGRAM

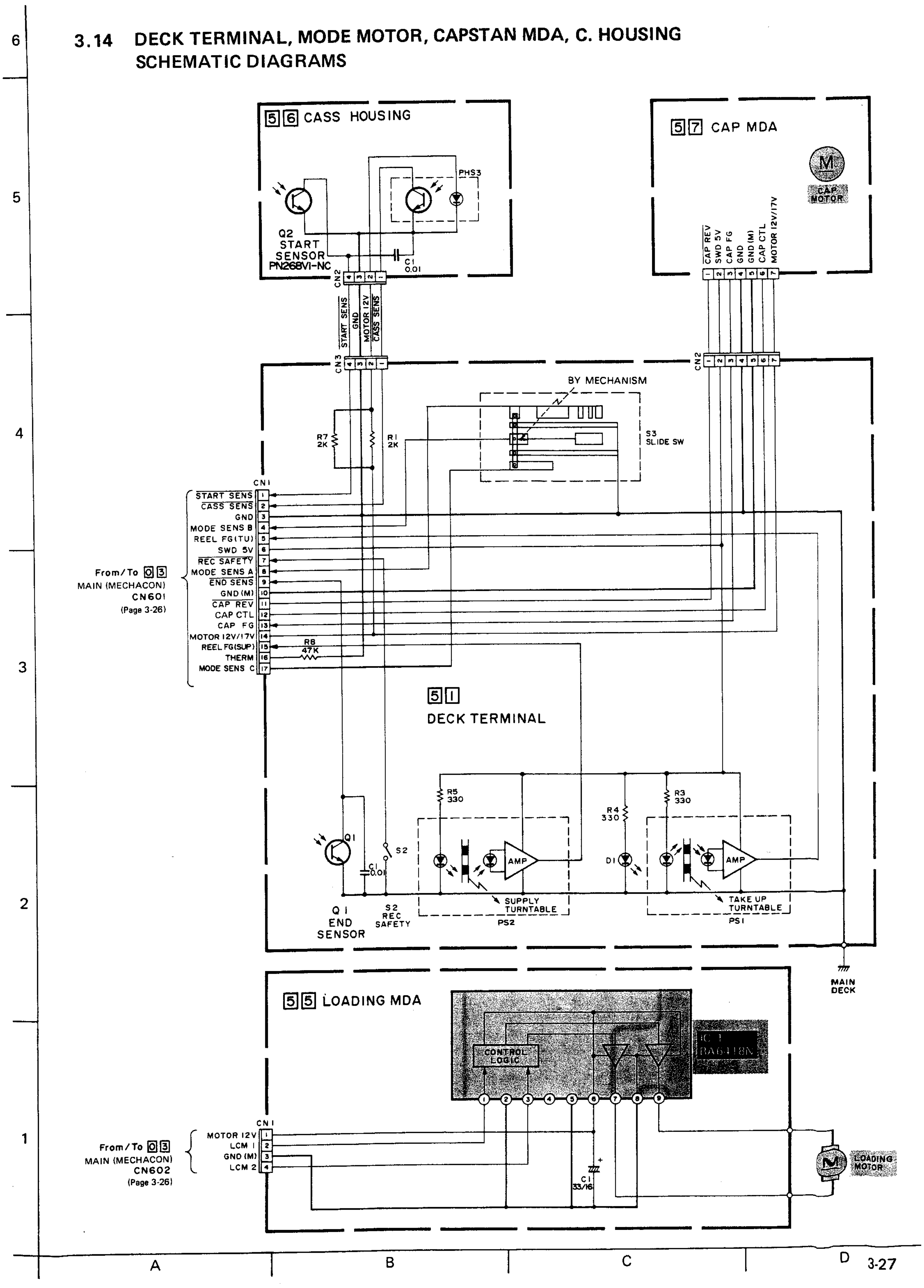


03 MAIN (AUDIO)
From 03 MAIN (MECHACON)
(Page 3-25)
EE MA8
AUX MA10
Q3 DTA114ES
D3 RD5.1ES-T1B2
SWD 12 V
C25 4.7/16
R46 4.7K
D2
R45 2.2K
C6 0.0015
R15 18K
R16 180
C9 10/16
C10 0.01
R23 6.2K
R24 15K
R22 6.8K
R21 18K
R18 10K
R17 270K
C8 1/50
C11 1/50
C24 0.0022
R25 15K
C12 10/16
R41 4.7M
R27 4.7M
R26 4.7M
R28 12K
R29 33K
C13 10/16
PB 80 mVp-p
PB 40 mVp-p
REC/PB 2.0 Vp-p
REC/PB 1.0 Vp-p
REC 0.9 Vp-p
AUDIO OUT
AUDIO IN
AUDIO OUT
GND(A)
AUDIO IN
A/V IN OUT
R1 47K
C1 560P
C2 560P
R2 47K
R4 2.4K
C21 0.0015
R6 2.2K
Q1
Q2
R5 10K
Q1,Q2 2SC1740S(RS)
From / To 03 MAIN(VIDEO)
(Page 3-32)
TNR AUDIO VA1
RF AUDIO AV1
EQ1
EQ2
Vcc/2
PB ON
PB
REC
AGC
LINE
IC1
REC CTL
EQ
MUTE
R7 1K
R8 1K
R9 1K
C20 0.0082
C14 33/16
C15 0.1/50
L5 470
C16 1/50
L1 10m
R30 10K
R32 33K
R34 150
C17 0.01
R36 3.3K
R37 27K
R40 2.7K
C19 3.3/50
REC/PB 2.0 Vp-p
R47 4.7
RA1 SWD12V
RA2 GND
From 03 MAIN (REGULATOR)
(Page 3-18)
REC 47 Vp-p
REC 44 Vp-p
12 A/C HEAD
CN1
REC/PB
AE
TP33
TP31
TP32
R10 10
TP31 BIAS(+)
TP32 BIAS(−)
TP33 ERASE
REC 2.4 Vp-p
REC 0.24 Vp-p
Q6
SWD 12 V
MA6 SP
R11 68K
C26 330P
T1
R11 BIAS ADJ
C3 0.0027
R12 15K
Q4
Q5 DTA124ES
Q5
R49 47K
MA9 MUTE
MA7 REC START
MA5 REC
From 03 MAIN (MECHACON)
(Page 3-25)
F.E
CN2
C27 0.047
C5 4.7/25
C4 0.0039
R13 6.8
REC 75 Vp-p
Q4 2SC1740S(RS)
IC1 BA7765AS
Q6 DTA144ES
6
5
4
3
2
1
A
B
C
D
E
F
G
H

## 3.13 SYSTEM CTL SCHEMATIC DIAGRAM


03 MAIN (MECHACON)
From/To 03 MAIN (REGULATOR) (Page 3-18)
VPT 5V RM8
IC603 M50253P
VPT 5 V
VPT ADAPTOR
From 03 MAIN (VIDEO) (Page 3-32)
VMI VPT VIDEO
Frome/To 08 TUNER CTL CN2 (Page 3-35)
CN605
UHF
VHF H
VHF L
NC
UHF
VH
VL
VDD
E. CLK
E. DATA
Vss
From/To 08 TUNER CTL CN2 (Page 3-35)
CN604
PWM
M. CE
M. DATA
GND
AUDIO MUTE
TNR CTL
AFC DEF
SYNC DET
M. CLOCK
R641 470
C603 3.3/25
C602 0.022
R639 4.7K
NC
CN602
LCM 2
GND (M)
LCM 1
MOTOR 12V
MOTOR 12 V
From/To 55 LOADING MDA CN1 (Page 3-27)
CN603
S. DATA
S. CLOCK
REMOTE
SWD 5V
UNSW 5.8V
GND
TIMER S-CLK
TIMER DATA
CTL CLOCK
UNSW 12V
SWD 5 V
UNSW 5.8 V
UNSW 12 V
From/To 21 TIMER/DISP/SW CN2 (Page 3-40)
IC601 M37418M6-364P
R631 56K
L601 2.2
R632 10K
R633 30K
RA601 3 x 10K
From/To 03 MAIN (SERVO) (Page 3-21, 22)
SM7 CTL CLOCK
MS8 DRUM CTL V
SM8 AVG FM
From/To 03 MAIN (SERVO) (Page 3-21)
INDEX SM1
S. DATA MS1
S. CLOCK MS2
C604 0.1
R623 1K
Vcc
INDEX
S. DATA
S/M/P CLK
M. DATA
M. CE
TNR CTL
EXP. DATA
V. UP (FF ONLY)
A. MUTE
TEXT
AFC DEF
SYNC DET
SP
P MUTE
POWER ON/OFF
EE
REC
REC START
END SENS
AUX
CASS
R. PAUSE
REEL FG (SUP)
REEL FG (TU)
START SENS
LCM 1
LCM 2
DRUM DRIVE
CAP CTL
AVG FM
THERM
MODE SENS 1
MODE SENS 2
MODE SENS 3
CLK
DATA
REC SF
CAP REV
SERVO
CAP FG
CTL PULSE
PWM
PAUSE
NC
V. PULSE
D. FF
Vss
RESET
X IN
X OUT
Vss
R601 3.3K
R602 3.3K
R603 10K
R604 4.7K
R605 1K
R609 1K
R606 4.7K
R607 4.7K
R608 4.7K
R610 1K
R611 1K
R612 4.7K
R613 1K
R614 10K
R638 10K
R616 10K
C606 120P
TP601 CLK
TP602 DATA
To 03 MAIN (VIDEO) (Page 3-32)
TEXT MV10
C607 470P
SP MV1
P. MUTE MV6
EE MV2
REC START MV4
REC MV3
AUX MV7
R622 1K
R615 4.7K
R621 4.7K
R620 4.7K
R619 4.7K
R618 4.7K
R617 4.7K
SERVO
SM3 CAP FG
SM4 CTL PULSE
MS6 PAUSE
MS7 SWD 5V
MS5 V. PULSE
SM2 DRUM FF
MS4 CAP FG
SM5 CAP DRIVE
D604
D603
D603,D604 MA165
R624 1M
CF601
R628 8.2K
D602
D602,D605 MA165
R634 150K
To 03 MAIN (AUDIO) (Page 3-23, 24)
SP MA6
AUX MA10
REC MA5
REC START MA7
MUTE MA9
EE MA8
Q602 DTC114ES
R643 2.2K
C609 22P
R629 470
R637 220K
R630 33K
C605 100/6.3
R635 33K
D605
R636 10K
From/To 51 DECK TERMINAL, CN1 (Page 3-27)
CN601
START SENS
CASS SENS
GND
MODE SENS 2
REEL FG (TU)
SWD 5V
REC SAFETY
MODE SENS 1
END SENS
GND (M)
REV
CAP CTL
CAP FG
MOTOR 12V/17V
REEL FG (SUP)
THERM
MODE SENS 3
Page 3-27
From/To 03 MAIN (REGULATOR) (Page 3-18)
Q603 2SB1425(EU)
R642 4.7K
MOTOR 17V
POWER ON/OFF
MOTOR 17V RM7
ON/OFF MR1
GND RM6
GND (M) RM5
UNSW 12V RM4
SWD 5V RM3
UNSW 5.8V RM2
MOTOR 12V RM1
UNSW 12 V
SWD 5 V
UNSW 5.8 V
MOTOR 12 V
D601 HZS7.5EB2
R625 4.7K
C601 1/50
D601
R626 10K
R627 10K
SWD 5 V
D606
D606 11ES2
CP601
CP601 ICP-F25
TH801
REMOTE JACK REAR
C608 330/16
MOTOR 12V MS9
MOTOR 12V
To 03 MAIN (SERVO) (Page 3-22)

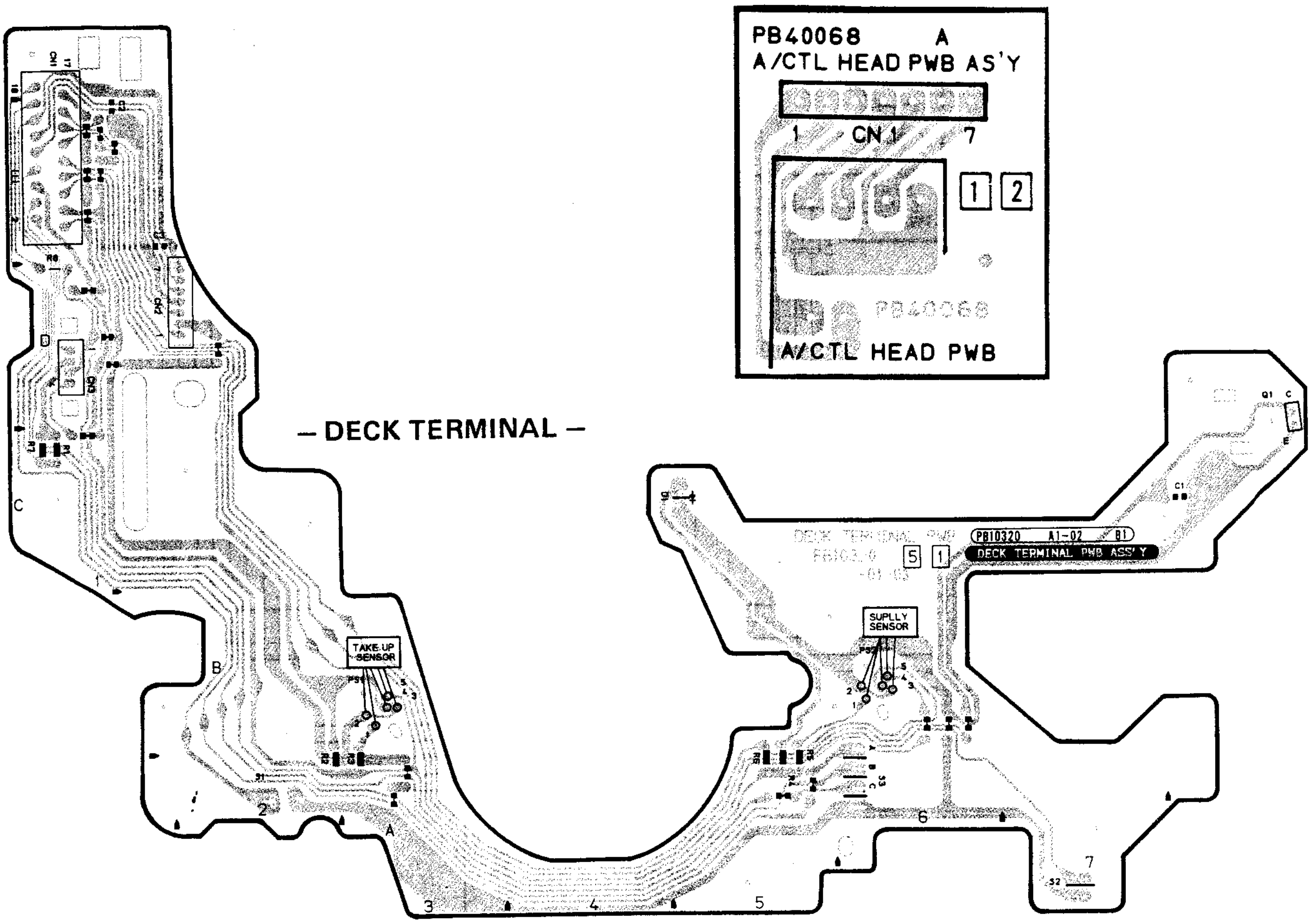
## 3.14 DECK TERMINAL, MODE MOTOR, CAPSTAN MDA, C. HOUSING SCHEMATIC DIAGRAMS



6
5
4
3
2
1
A
B
C
D
56 CASS HOUSING
PHS3
Q2
START
SENSOR
PN268V1-NC
C1
0.01
CN2
START SENS
GND
MOTOR 12V
CASS SENS
CN3
57 CAP MDA
M
CAP MOTOR
CAP REV
SWD 5V
CAP FG
GND
GND (M)
CAP CTL
MOTOR 12V/17V
CN2
BY MECHANISM
S3
SLIDE SW
R7
2K
R1
2K
CN1
START SENS
CASS SENS
GND
MODE SENS B
REEL FG(TU)
SWD 5V
REC SAFETY
MODE SENS A
END SENS
GND (M)
CAP REV
CAP CTL
CAP FG
MOTOR 12V/17V
REEL FG(SUP)
THERM
MODE SENS C
From/To 03
MAIN (MECHACON)
CN601
(Page 3-26)
R8
47K
51
DECK TERMINAL
R5
330
R4
330
R3
330
Q1
C1
0.01
S2
AMP
D1
AMP
SUPPLY
TURNTABLE
PS2
TAKE UP
TURNTABLE
PS1
Q1
END
SENSOR
S2
REC
SAFETY
MAIN
DECK
55 LOADING MDA
CONTROL
LOGIC
IC1
BA6418N
CN1
MOTOR 12V
LCM 1
GND (M)
LCM 2
From/To 03
MAIN (MECHACON)
CN602
(Page 3-26)
C1
33/16
M
LOADING
MOTOR

# 3.15 DECK TERMINAL, MODE MOTOR, C. HOUSING, A/C HEAD CIRCUIT BOARDS

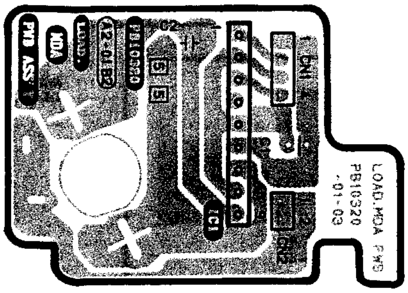
– A/C HEAD –


PB40068 A
A/CTL HEAD PWB AS'Y
1
CN1
7
1
2
PB40068
A/CTL HEAD PWB

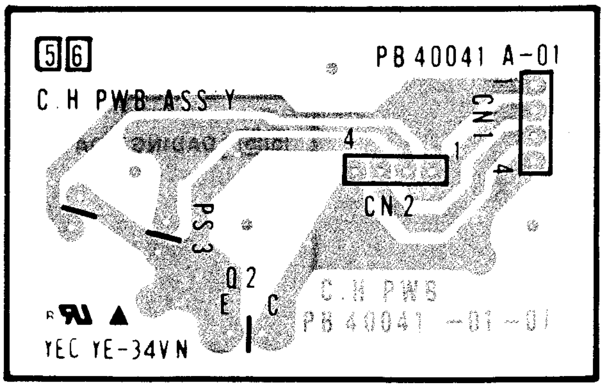
– DECK TERMINAL –

C
B
A
TAKE UP SENSOR
SUPLLY SENSOR
DECK TERMINAL PWB
PB10320 A1-02 B1
DECK TERMINAL PWB ASS'Y
5
1
Q1
C
E
1
2
3
4
5
6
7

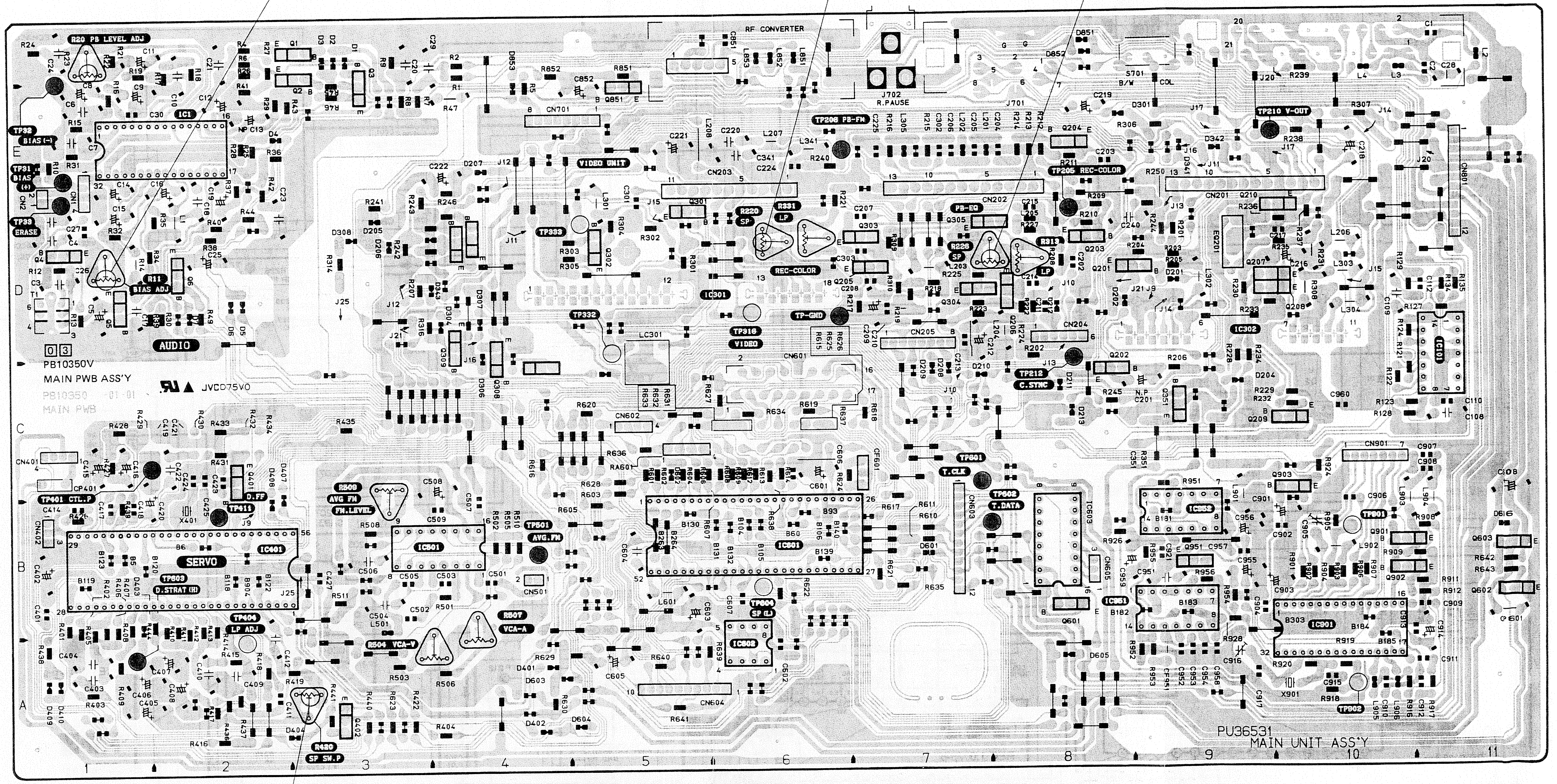
– MDA –


PWB ASS'Y
MDA
A2-01 B2
PB10320
5
5
CN1
LOAD.MDA PWB
PB10320
-01-03

– CASSETTE HOUSING –


5
6
PB 40041 A-01
C.H PWB ASS'Y
CN1
4
1
4
CN2
PS3
Q2
E
C
C.H PWB
PB 40041 -01-01
YEC YE-34VN

## 3.16 MAIN CIRCUIT BOARD


R20 PB LEVEL ADJ
RF CONVERTER
VIDEO UNIT
AUDIO
SERVO
PB10350V
MAIN PWB ASS'Y
JVCD75V0
REC-COLOR
TP210 V-OUT
TP205 REC-COLOR
TP206 PB-FM
TP212 C.SYNC
TP601 T.CLK
TP602 T.DATA
TP501 AVG.FM
R509 AVG FM FM.LEVEL
R504 VCA-V
R507 VCA-A
TP404 LP ADJ
TP401 CTL.P
TP411 D.FF
TP603 D.STRAT (H)
R420 SP SW.P
PU36531
MAIN UNIT ASS'Y

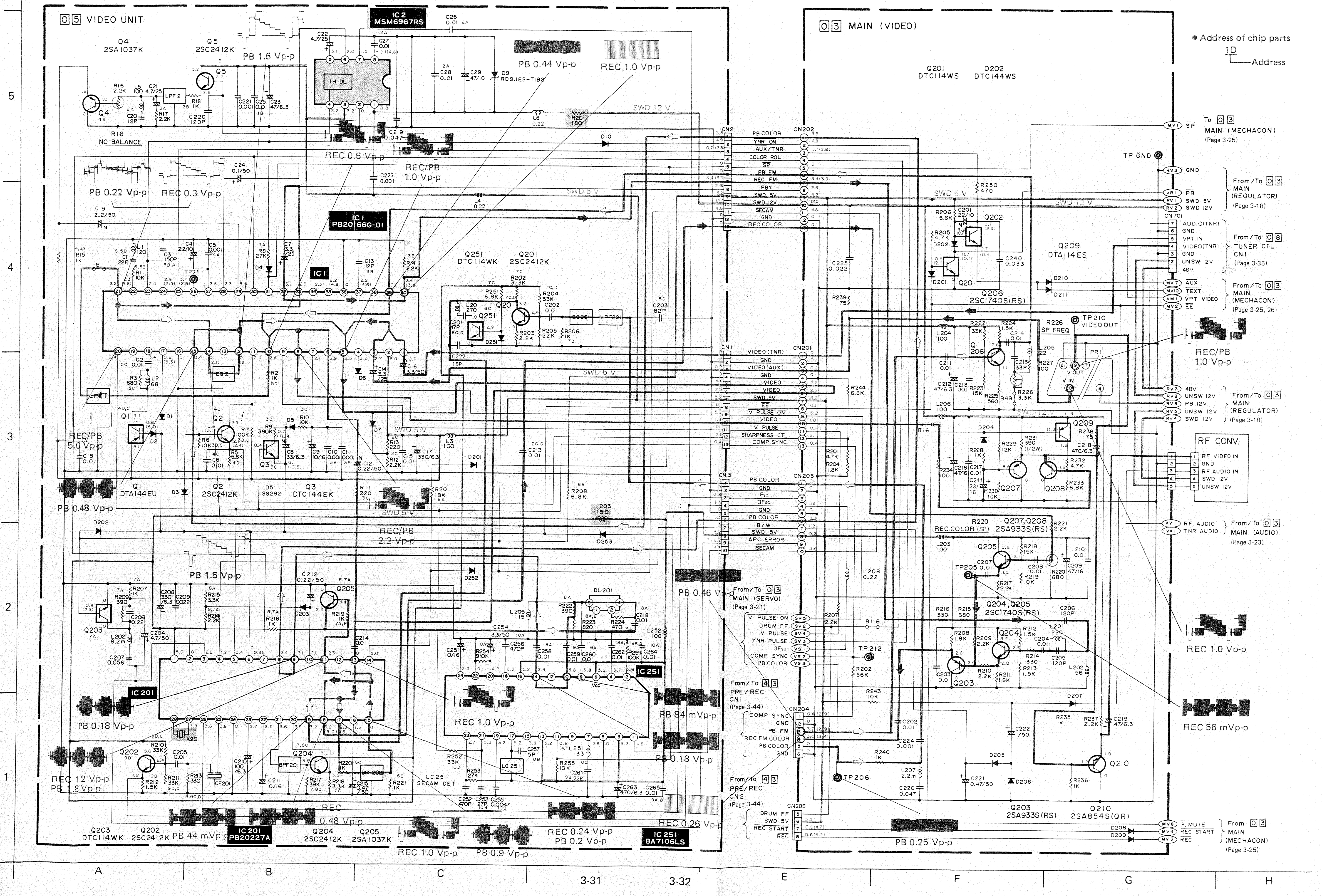
R11
BIAS ADJ

R220
REC COLOR (SP)

R226
SP FREQ

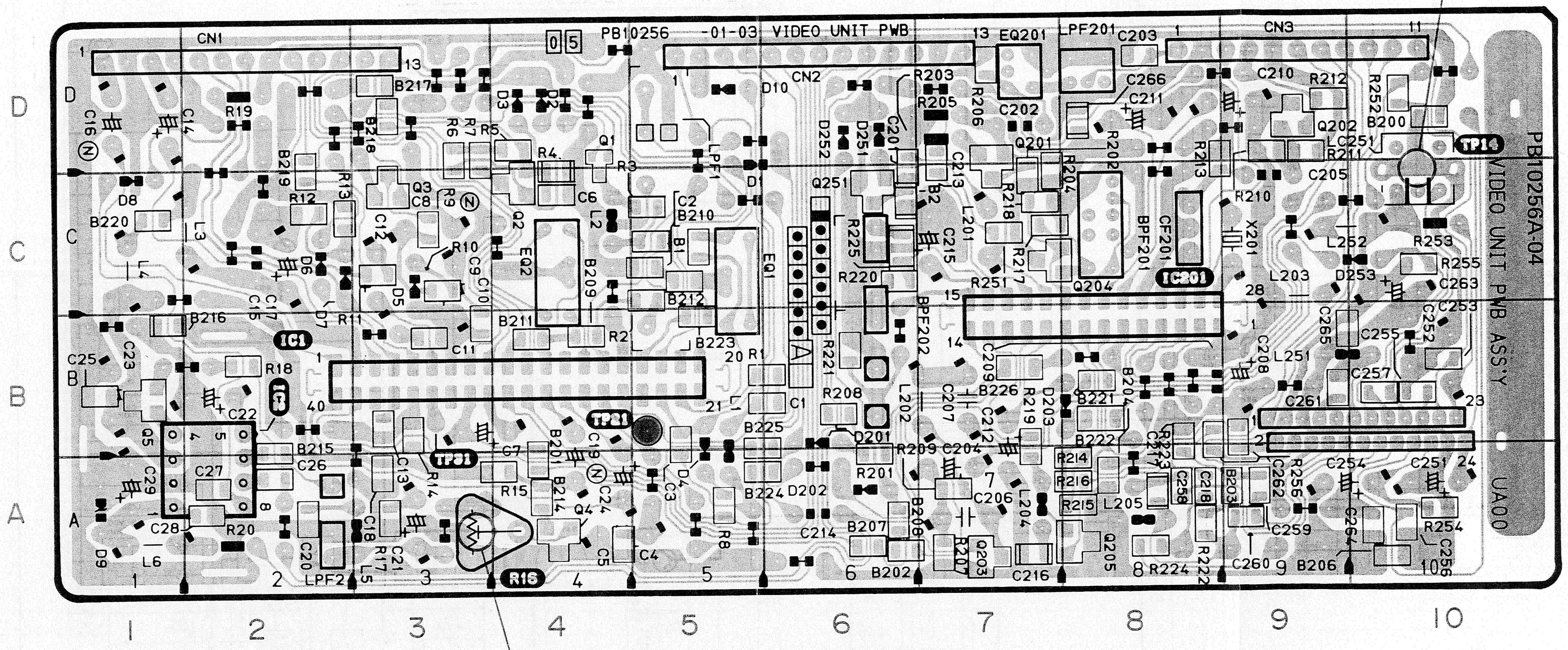
R420
SP SW POINT

## 3.17 VIDEO UNIT & VIDEO (MAIN) SCHEMATIC DIAGRAM


05 VIDEO UNIT
03 MAIN (VIDEO)
● Address of chip parts
1D
Address
IC 2 MSM6967RS
IC 1 PB20166G-01
IC 201 PB20227A
IC 251 BA7106LS
Q4 2SA1037K
Q5 2SC2412K
Q1 DTA144EU
Q2 2SC2412K
Q3 DTC144EK
D5 1SS292
Q203 DTC114WK
Q202 2SC2412K
Q204 2SC2412K
Q205 2SA1037K
Q251 DTC114WK
Q201 2SC2412K
Q201 DTC114WS
Q202 DTC144WS
Q209 DTA114ES
Q206 2SC1740S(RS)
Q207,Q208 2SA933S(RS)
Q204,Q205 2SC1740S(RS)
Q203 2SA933S(RS)
Q210 2SA854S(QR)
PB 1.5 Vp-p
PB 0.44 Vp-p
REC 1.0 Vp-p
REC 0.6 Vp-p
REC/PB 1.0 Vp-p
PB 0.22 Vp-p
REC 0.3 Vp-p
REC/PB 5.0 Vp-p
PB 0.48 Vp-p
REC/PB 2.2 Vp-p
PB 1.5 Vp-p
PB 0.18 Vp-p
REC 1.2 Vp-p
PB 1.8 Vp-p
PB 44 mVp-p
REC 0.48 Vp-p
REC 1.0 Vp-p
PB 0.9 Vp-p
REC 0.24 Vp-p
PB 0.2 Vp-p
REC 0.26 Vp-p
PB 0.18 Vp-p
PB 84 mVp-p
PB 0.46 Vp-p
REC 1.0 Vp-p
REC/PB 1.0 Vp-p
REC 1.0 Vp-p
REC 56 mVp-p
PB 0.25 Vp-p
R16 NC BALANCE
SWD 12 V
SWD 5 V
TP GND
TP 210 VIDEO OUT
TP 205
TP 212
TP 206
TP 21
R226 SP FREQ
R220 REC COLOR (SP)
RF CONV.
RF VIDEO IN
GND
RF AUDIO IN
SWD 12V
UNSW 12V
CN2
CN202
PB COLOR
YNR ON
AUX/TNR
COLOR ROL
SP
PB FM
REC FM
PBY
SWD 5V
SWD 12V
SECAM
GND
REC COLOR
CN1
CN201
VIDEO (TNR)
GND
VIDEO (AUX)
GND
VIDEO
VIDEO
SWD 5V
EE
V PULSE ON
VIDEO
V PULSE
SHARPNESS CTL
COMP SYNC
CN3
CN203
PB COLOR
GND
Fsc
3Fsc
GND
PB COLOR
B/W
SWD 5V
APC ERROR
SECAM
To 03 MAIN (MECHACON) (Page 3-25)
SP
GND
PB
SWD 5V
SWD 12V
From/To 03 MAIN (REGULATOR) (Page 3-18)
CN701
AUDIO(TNR)
GND
VPT IN
VIDEO(TNR)
GND
UNSW 12V
48V
From/To 08 TUNER CTL CN1 (Page 3-35)
AUX
TEXT
VPT VIDEO
EE
From/To 03 MAIN (MECHACON) (Page 3-25, 26)
48V
UNSW 12V
PB 12V
UNSW 12V
SWD 12V
From/To 03 MAIN (REGULATOR) (Page 3-18)
RF AUDIO
TNR AUDIO
From/To 03 MAIN (AUDIO) (Page 3-23)
From/To 03 MAIN (SERVO) (Page 3-21)
V PULSE ON
DRUM FF
V PULSE
YNR PULSE
3Fsc
COMP SYNC
PB COLOR
From/To 43 PRE/REC CN1 (Page 3-44)
CN204
COMP SYNC
GND
PB FM
REC FM COLOR
PB COLOR
GND
From/To 43 PRE/REC CN2 (Page 3-44)
CN205
DRUM FF
SWD 5V
REC START
REC
P. MUTE
REC START
REC
From 03 MAIN (MECHACON) (Page 3-25)
LPF 2
1H DL
EQ-2
DL 201
BPF201
BPF202
LC251
LC 251 SECAM DET
X201
CF201
D9 RD9.1ES-T1B2
A
B
C
E
F
G
H
1
2
3
4
5
6

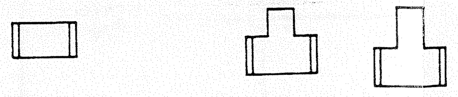
## 3.18 VIDEO UNIT CIRCUIT BOARD

LC251
SECAM DET


PB10256 -01-03 VIDEO UNIT PWB
PB10256A-04
VIDEO UNIT PWB ASS'Y
UA00
CN1
CN2
CN3
EQ201
LPF201
IC1
IC201
TP14
TP21
TP31
R16
LC251
Q201
Q202
Q204
Q251
X201
CF201
BPF201
BPF202
D
C
B
A
1
2
3
4
5
6
7
8
9
10

R16
NC BAL

**Note:** Double edging indicates not used in this model.
Examples ; Resistor, Capacitor, Transistor, DIODE



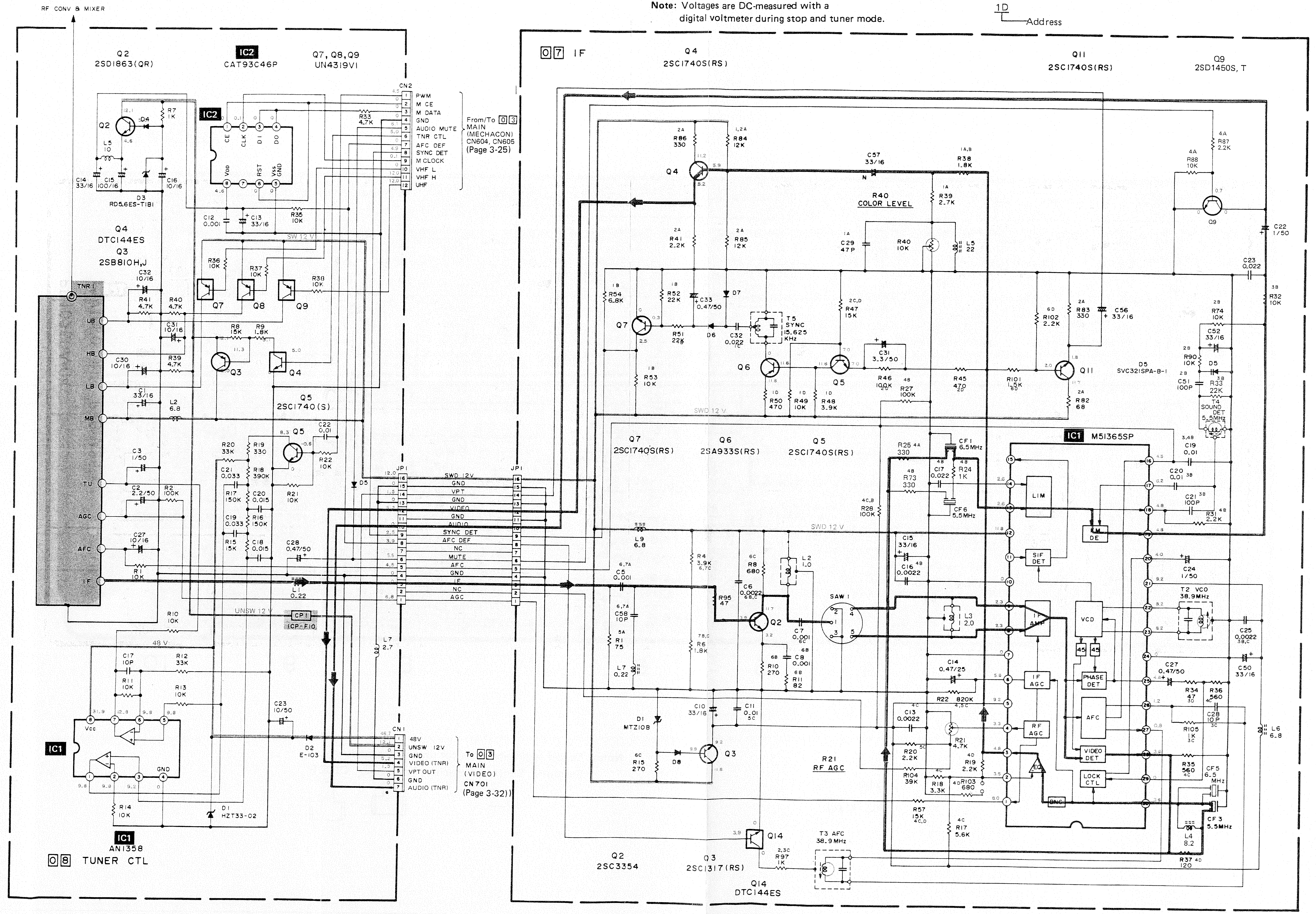
6
5
4
3
2
1

A B C E F G H

## 3.19 IF & TNR CTL SCHEMATIC DIAGRAM

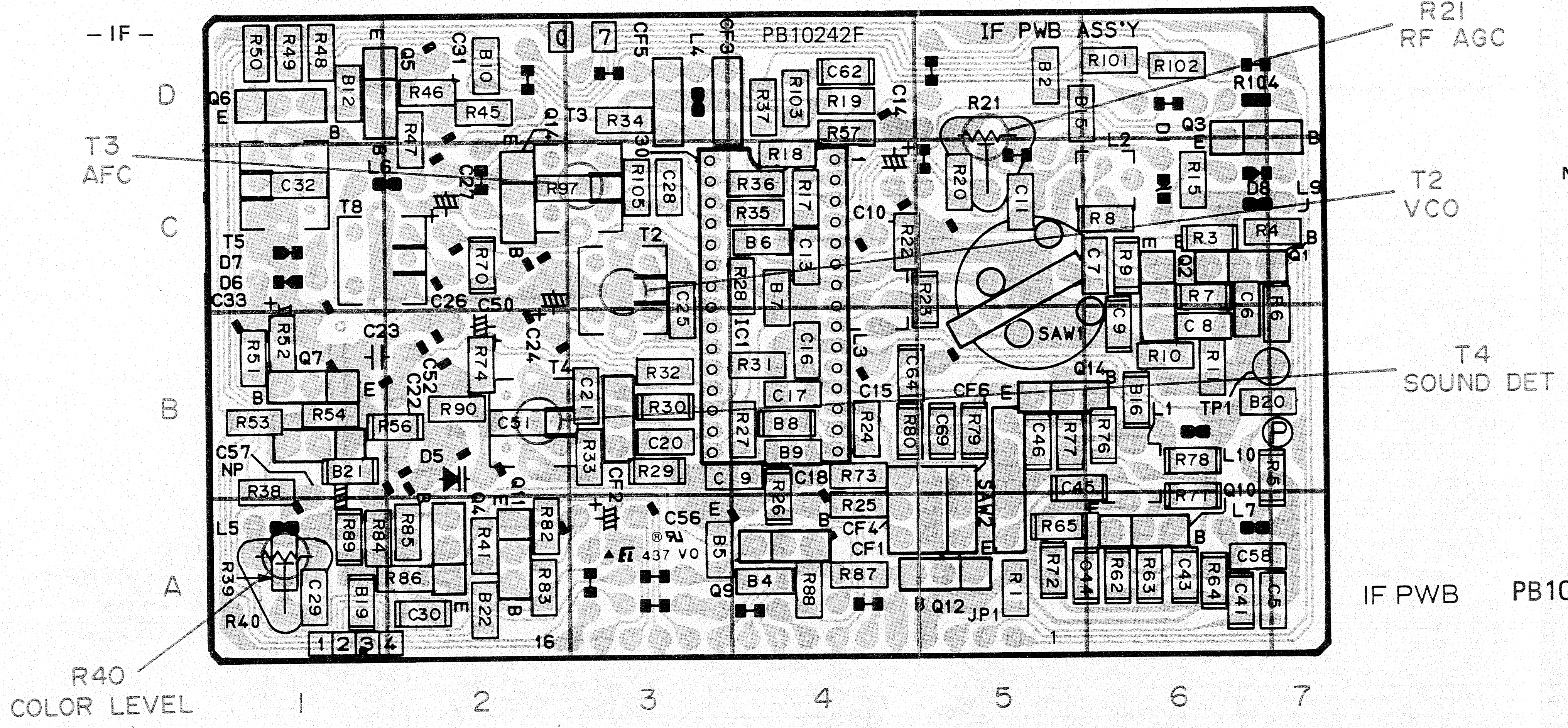
**Note:** Voltages are DC-measured with a digital voltmeter during stop and tuner mode.

● Address of chip parts
1D
└─Address



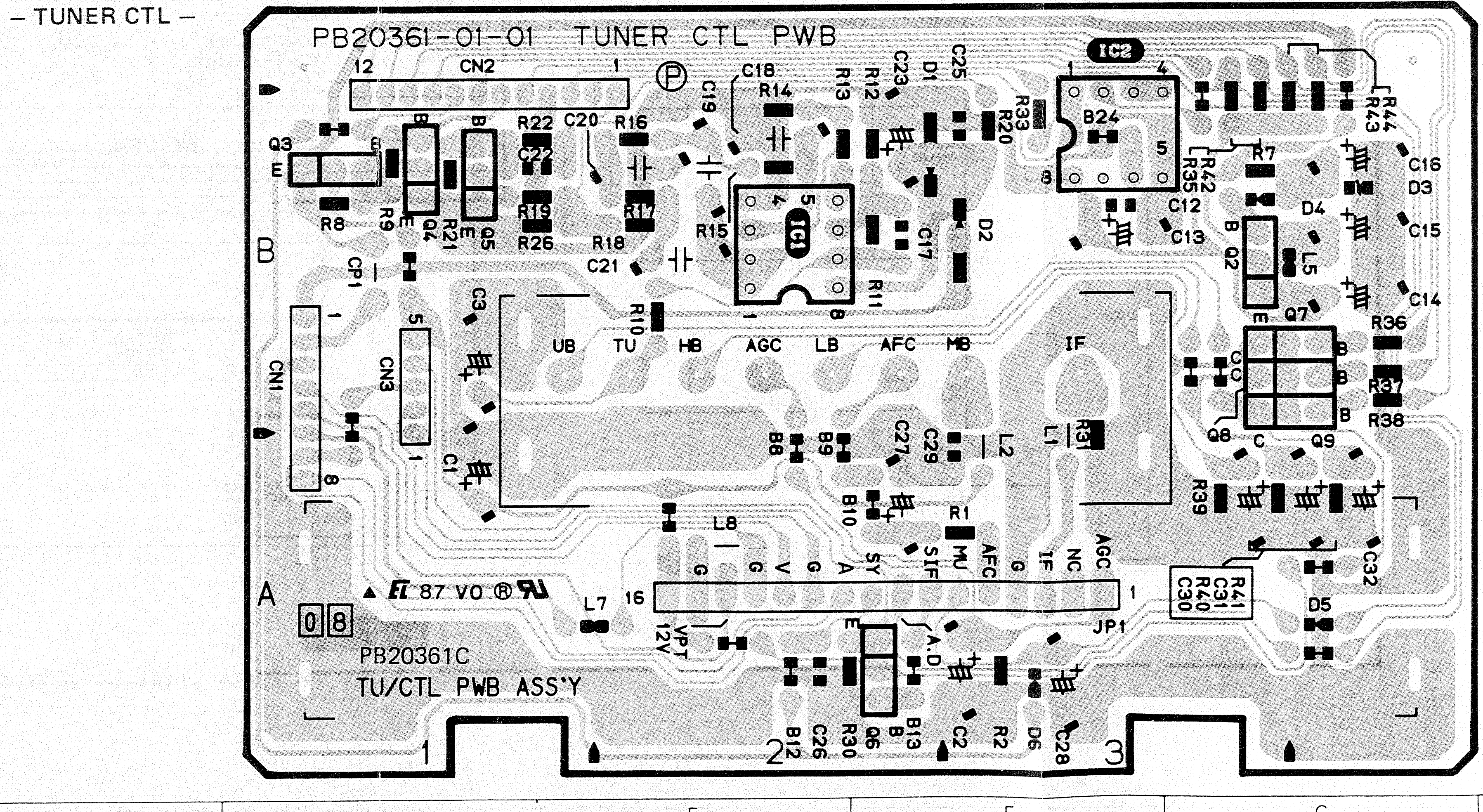
RF CONV & MIXER
Q2 2SD1863(QR)
IC2 CAT93C46P
Q7, Q8, Q9 UN4319V1
CN2
PWM
M CE
M DATA
GND
AUDIO MUTE
TNR CTL
AFC DEF
SYNC DET
M CLOCK
VHF L
VHF H
UHF
From/To 03 MAIN (MECHACON) CN604, CN605 (Page 3-25)
Q4 DTC144ES
Q3 2SB810H,J
Q5 2SC1740(S)
TNR1
UB
HB
LB
MB
TU
AGC
AFC
IF
JP1
SWD 12V
VPT
VIDEO
AUDIO
SYNC DET
AFC DEF
NC
MUTE
UNSW 12 V
SW 12 V
48 V
CP1 ICP-F10
CN1
48V
UNSW 12V
VIDEO (TNR)
VPT OUT
AUDIO (TNR)
To 03 MAIN (VIDEO) CN701 (Page 3-32)
IC1 AN1358
D1 HZT33-02
D2 E-103
D3 RD5.6ES-T1B1
08 TUNER CTL
07 IF
Q4 2SC1740S(RS)
Q11 2SC1740S(RS)
Q9 2SD1450S, T
R40 COLOR LEVEL
T5 SYNC 15.625 KHz
Q7 2SC1740S(RS)
Q6 2SA933S(RS)
Q5 2SC1740S(RS)
D5 SVC321SPA-8-1
T4 SOUND DET 5.5MHz
IC1 M51365SP
CF1 6.5MHz
CF6 5.5MHz
LIM
FM DE
SIF DET
IF AMP
VCO
PHASE DET
AFC
VIDEO DET
LOCK CTL
IF AGC
RF AGC
SAW1
T2 VCO 38.9MHz
CF5 6.5 MHz
CF3 5.5MHz
R21 RF AGC
T3 AFC 38.9MHz
D1 MTZ10B
Q2 2SC3354
Q3 2SC1317(RS)
Q14 DTC144ES
SWD 12 V
6
5
4
3
2
1
A
B
C
E
F
G
H

## 3.20 IF & TNR CTL CIRCUIT BOARDS

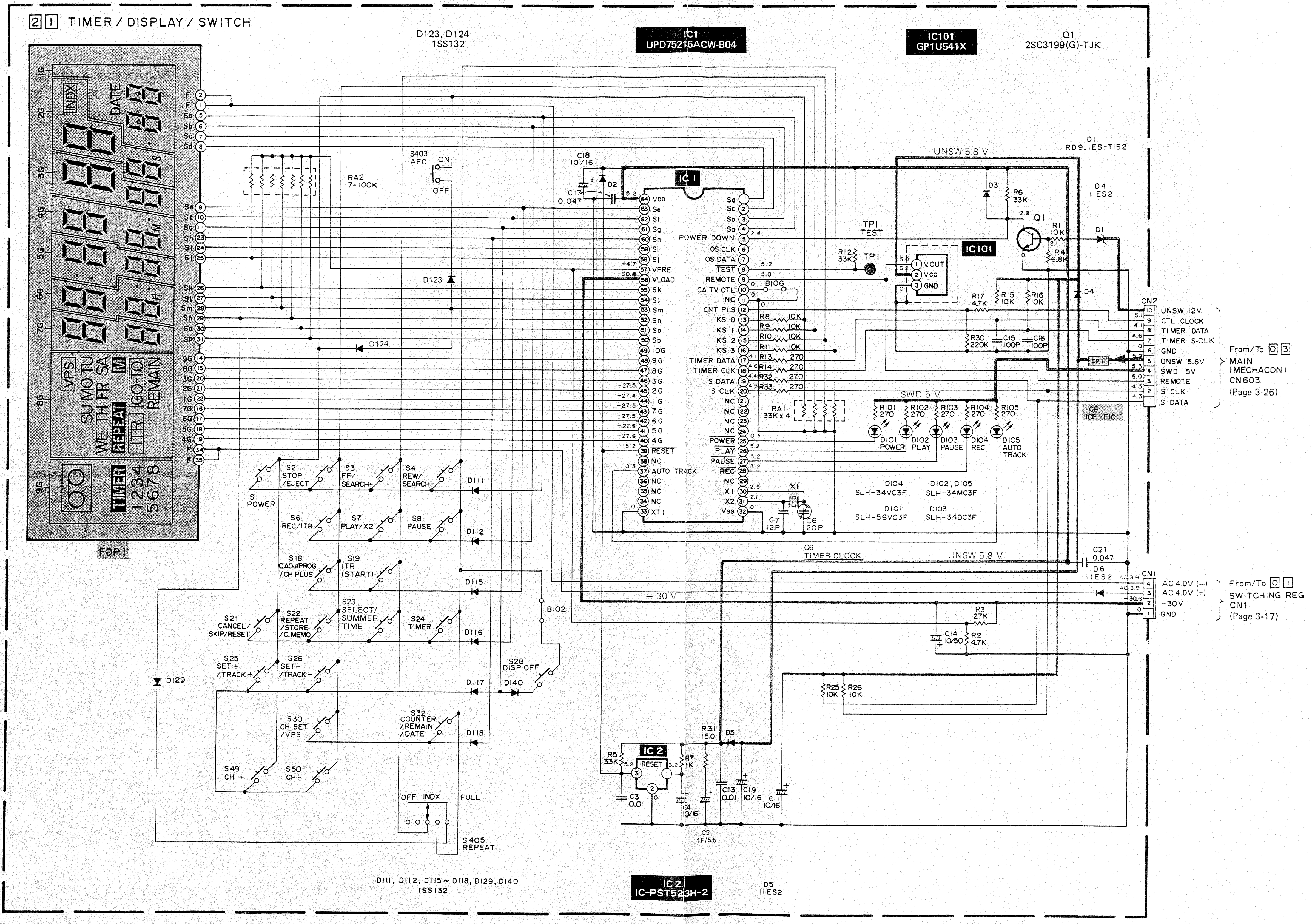

— IF —
PB10242F
IF PWB ASS'Y
R21
RF AGC
T3
AFC
T2
VCO
T4
SOUND DET
R40
COLOR LEVEL
SAW1
SAW2
IC1
TP1
JP1
437 VO
D
C
B
A
1
2
3
4
5
6
7

IF PWB PB10242-01-01

**Note:** Double edging indicates not used in this model.
Examples; Resistor, Capacitor, Transistor, DIODE

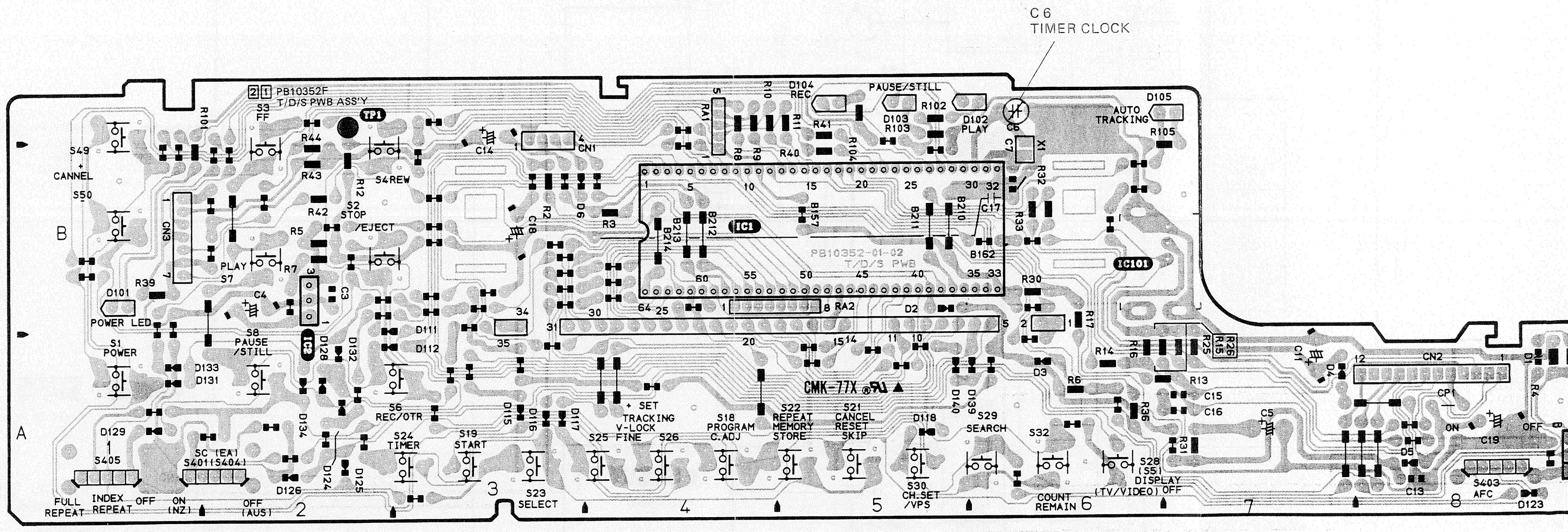

— TUNER CTL —
PB20361-01-01 TUNER CTL PWB
IC1
IC2
CN1
CN2
CN3
JP1
UB
TU
HB
AGC
LB
AFC
MB
IF
87 VO
PB20361C
TU/CTL PWB ASS'Y
B
A
1
2
3

## 3.21 TIMER/DISP/SW SCHEMATIC DIAGRAM

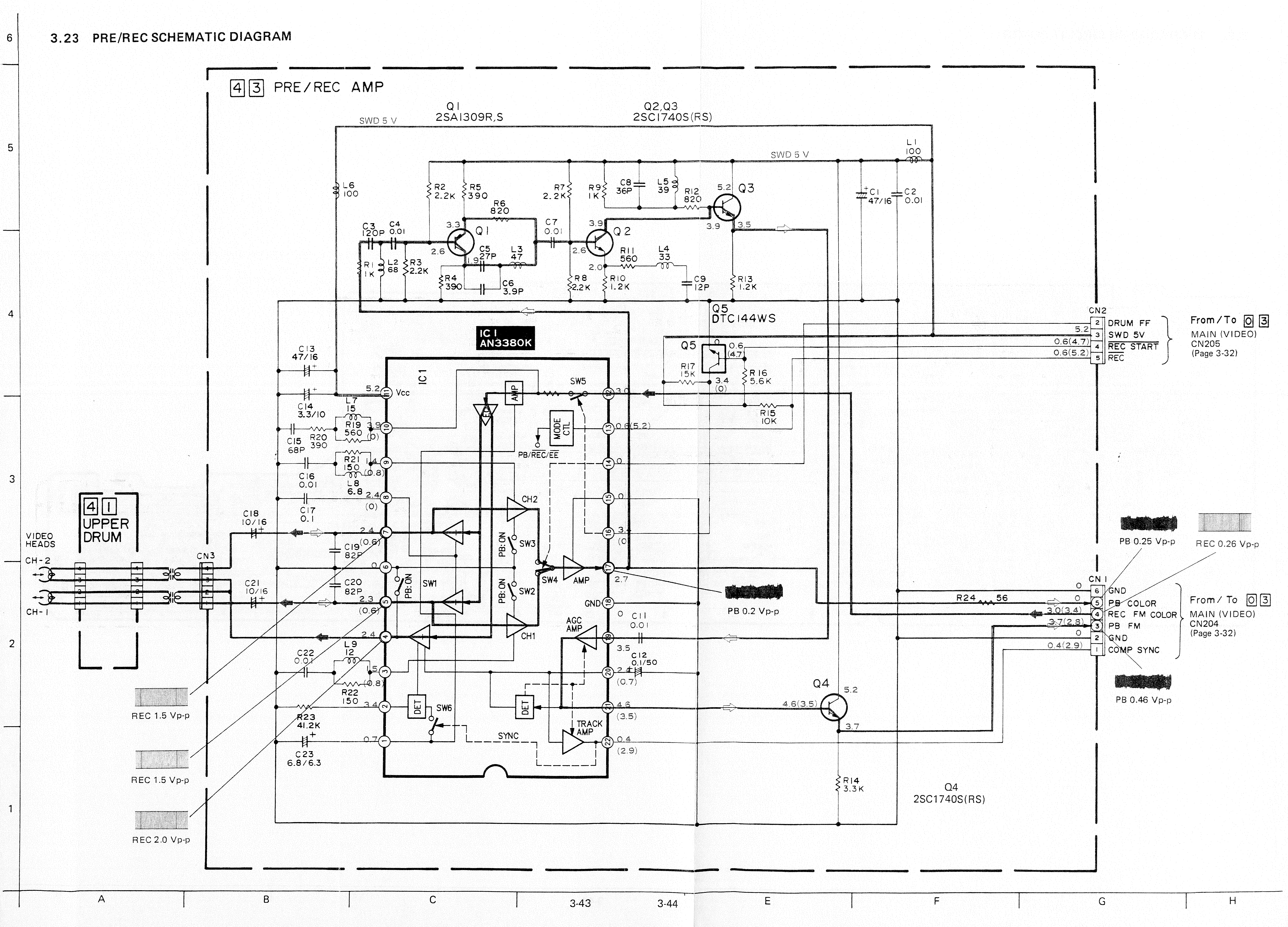


2 1 TIMER / DISPLAY / SWITCH
D123, D124
1SS132
IC1
UPD75216ACW-B04
IC101
GP1U541X
Q1
2SC3199(G)-TJK
FDP1
INDX
DATE
VPS
SU MO TU
WE TH FR SA
REPEAT
ITR
GO-TO
REMAIN
TIMER
1234
5678
RA2
7-100K
S403
AFC
ON
OFF
C18
10/16
C17
0.047
D2
D123
D124
UNSW 5.8 V
D1
RD9.1ES-T1B2
D3
R6
33K
Q1
R1
10K
R4
6.8K
D4
11ES2
D1
TP1
TEST
R12
33K
TP1
IC101
VOUT
Vcc
GND
R17
4.7K
R15
10K
R16
10K
R30
220K
C15
100P
C16
100P
B106
CP1
ICP-F10
CN2
UNSW 12V
CTL CLOCK
TIMER DATA
TIMER S-CLK
GND
UNSW 5.8V
SWD 5V
REMOTE
S CLK
S DATA
From/To 0 3
MAIN
(MECHACON)
CN603
(Page 3-26)
VDD
POWER DOWN
OS CLK
OS DATA
TEST
REMOTE
CA TV CTL
CNT PLS
KS 0
KS 1
KS 2
KS 3
TIMER DATA
TIMER CLK
S DATA
S CLK
VPRE
VLOAD
RESET
AUTO TRACK
POWER
PLAY
PAUSE
REC
X1
X2
Vss
XT1
R8 10K
R9 10K
R10 10K
R11 10K
R13 270
R14 270
R32 270
R33 270
RA1
33K x 4
SWD 5 V
R101 270
R102 270
R103 270
R104 270
R105 270
D101 POWER
D102 PLAY
D103 PAUSE
D104 REC
D105 AUTO TRACK
D104
SLH-34VC3F
D102, D105
SLH-34MC3F
D101
SLH-56VC3F
D103
SLH-34DC3F
X1
C7
12P
C6
20P
C6
TIMER CLOCK
UNSW 5.8 V
C21
0.047
D6
11ES2
CN1
AC 4.0V (−)
AC 4.0V (+)
−30V
GND
From/To 0 1
SWITCHING REG
CN1
(Page 3-17)
− 30 V
R3
27K
C14
10/50
R2
4.7K
R25
10K
R26
10K
S1
POWER
S2
STOP
/EJECT
S3
FF/
SEARCH+
S4
REW/
SEARCH−
D111
S6
REC/ITR
S7
PLAY/X2
S8
PAUSE
D112
S18
CADJ/PROG
/CH PLUS
S19
ITR
(START)
D115
S21
CANCEL/
SKIP/RESET
S22
REPEAT
/STORE
/C.MEMO
S23
SELECT/
SUMMER
TIME
S24
TIMER
D116
B102
S25
SET +
/TRACK +
S26
SET −
/TRACK −
D117
S28
DISP OFF
D140
D129
S30
CH SET
/VPS
S32
COUNTER
/REMAIN
/DATE
D118
S49
CH +
S50
CH −
OFF INDX
FULL
S405
REPEAT
R5
33K
IC2
RESET
R7
1K
R31
150
D5
C3
0.01
C4
10/16
C13
0.01
C19
10/16
C11
10/16
C5
1F/5.5
D111, D112, D115 ~ D118, D129, D140
1SS132
IC2
IC-PST523H-2
D5
11ES2

## 3.22 TIMER/DISP/SW CIRCUIT BOARD

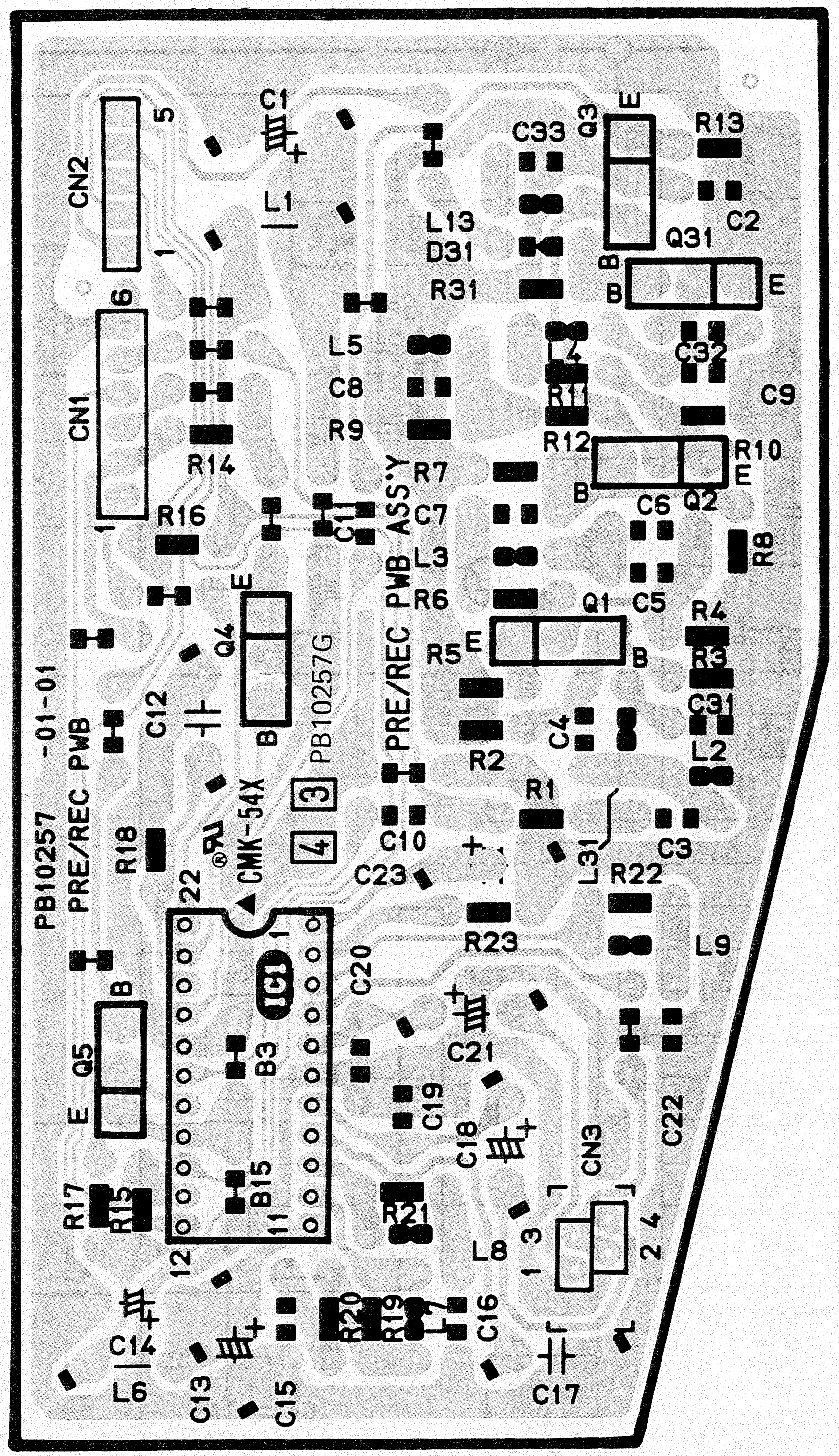

C6
TIMER CLOCK
PB10352F
T/D/S PWB ASS'Y
TP1
S3 FF
S49 CANNEL
S50
S4REW
S2 STOP /EJECT
PLAY
S7
R39
D101
POWER LED
S1 POWER
S8 PAUSE /STILL
D133
D131
D129
S405
FULL REPEAT
INDEX REPEAT
OFF
ON (NZ)
SC (EA) S401(S404)
OFF (AUS)
D126
D124
D125
D134
S6 REC/OTR
S24 TIMER
S19 START
S23 SELECT
S25
FINE
S26
+ SET TRACKING V-LOCK
S18 PROGRAM C.ADJ
S22 REPEAT MEMORY STORE
S21 CANCEL RESET SKIP
D118
S30 CH.SET /VPS
S29 SEARCH
S32
COUNT REMAIN
S28 (S5) DISPLAY (TV/VIDEO)
OFF
C13
S403 AFC
D123
ON
OFF
C19
CN2
CP1
CN1
CN3
IC1
IC2
IC101
PB10352-01-02 T/D/S PWB
CMK-77X
RA1
RA2
R10
D104 REC
PAUSE/STILL
R102
D103
R103
D102 PLAY
D105
AUTO TRACKING
R105
X1
C7
R32
R33
B162
C17
R30
R17
R14
R16
R25
R15
R26
C11
D4
D1
R1
R4
R13
C15
C16
C5
R36
R31
D5
R6
D3
D2
D139
D140
D111
D112
D115
D116
D117
D128
D132
C4
C3
R5
R7
R42
R43
R44
R12
R2
D6
R3
C18
C14
R101
R41
R40
R8
R9
R11
R104
B213
B214
B212
B157
B211
B210
1
2
3
4
5
6
7
8
A
B
E

## 3.23 PRE/REC SCHEMATIC DIAGRAM



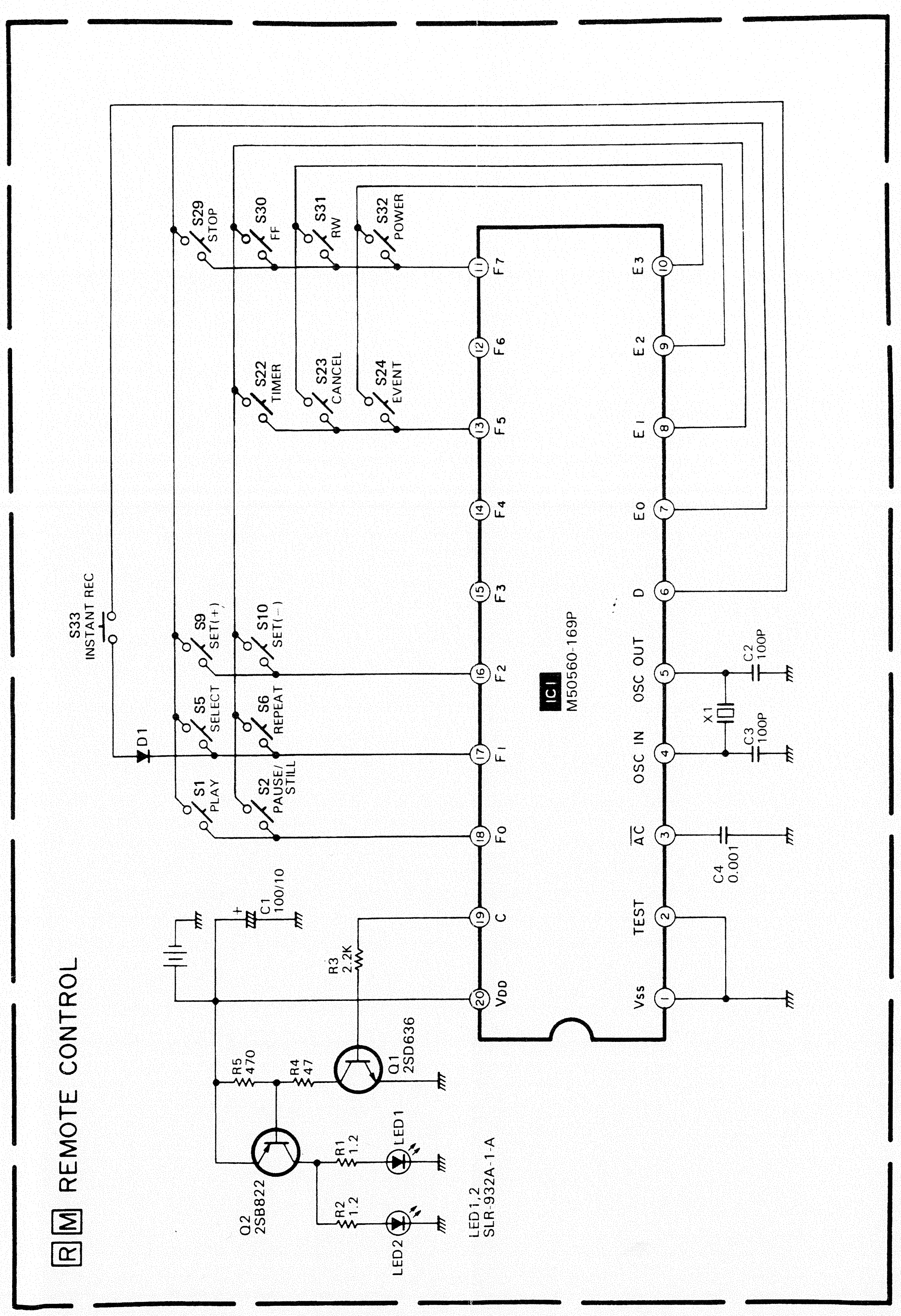
6
5
4
3
2
1
4 3 PRE/REC AMP
Q1
2SA1309R,S
Q2,Q3
2SC1740S(RS)
SWD 5 V
L1
100
L6
100
R2
2.2K
R5
390
R6
820
R7
2.2K
R9
1K
C8
36P
L5
39
R12
820
Q3
C1
47/16
C2
0.01
C3
120P
C4
0.01
Q1
C7
0.01
Q2
R1
1K
L2
68
R3
2.2K
C5
27P
L3
47
R11
560
L4
33
R4
390
C6
3.9P
R8
2.2K
R10
1.2K
C9
12P
R13
1.2K
Q5
DTC144WS
IC1
AN3380K
C13
47/16
Q5
R17
15K
R16
5.6K
R15
10K
C14
3.3/10
L7
15
R19
560
Vcc
SW5
AMP
MODE CTL
PB/REC/EE
C15
68P
R20
390
R21
150
C16
0.01
L8
6.8
C17
0.1
CH2
C18
10/16
C19
82P
PB:ON
SW3
SW4
AMP
C20
82P
SW1
PB:ON
SW2
C21
10/16
GND
AGC AMP
CH1
C11
0.01
C12
0.1/50
C22
0.01
L9
12
R22
150
DET
SW6
DET
TRACK AMP
SYNC
R23
41.2K
C23
6.8/6.3
Q4
R14
3.3K
Q4
2SC1740S(RS)
R24
56
CN2
DRUM FF
SWD 5V
REC START
REC
From/To 0 3
MAIN (VIDEO)
CN205
(Page 3-32)
CN1
GND
PB COLOR
REC FM COLOR
PB FM
GND
COMP SYNC
From/To 0 3
MAIN (VIDEO)
CN204
(Page 3-32)
PB 0.25 Vp-p
REC 0.26 Vp-p
PB 0.2 Vp-p
PB 0.46 Vp-p
VIDEO HEADS
CH-2
CH-1
4 1
UPPER DRUM
CN3
REC 1.5 Vp-p
REC 1.5 Vp-p
REC 2.0 Vp-p
A
B
C
E
F
G
H

## 3.24 PRE/REC CIRCUIT BOARD


CN2
5
1
C1
L1
L13
D31
R31
C33
Q3
E
B
R13
C2
Q31
E
B
6
CN1
L5
C8
R9
L4
R11
R12
C32
C9
R10
E
B
R14
R7
C7
L3
R6
R5
E
C6
Q2
R8
C5
Q1
B
R4
R3
C31
L2
1
R16
C11
E
Q4
B
C12
PB10257G
PRE/REC PWB ASS'Y
PB10257 -01-01
PRE/REC PWB
R18
22
CMK-54X
3
4
C10
C23
R2
R1
C4
L31
C3
R22
R23
L9
B
Q5
E
IC1
B3
B15
C20
C21
C19
C18
CN3
C22
R17
R15
12
11
R21
L8
1 3
2 4
C14
L6
C13
C15
R20
R19
L7
C16
C17

## 3.25 REMOTE CONTROL SCHEMATIC DIAGRAM

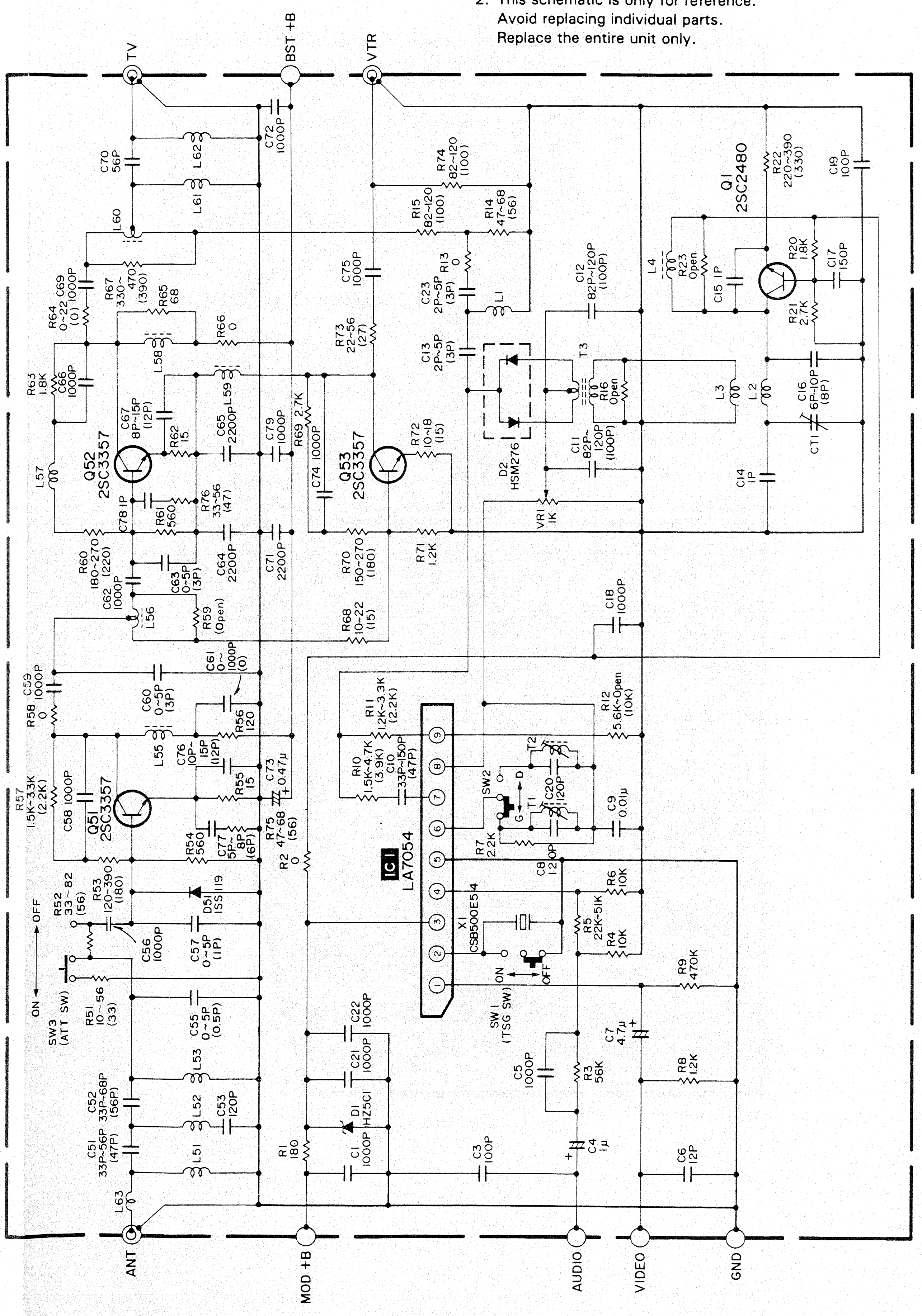
**NOTES:**
1. All parts shown in this schematic are critical for safety.
2. This schematic is only for reference.
Avoid replacing individual parts.
Replace the entrie unit only.



RM REMOTE CONTROL
IC1 M50560-169P
S29 STOP
S30 FF
S31 RW
S32 POWER
S22 TIMER
S23 CANCEL
S24 EVENT
S33 INSTANT REC
S9 SET(+)
S10 SET(−)
S5 SELECT
S6 REPEAT
S1 PLAY
S2 PAUSE/STILL
D1
F7
F6
F5
F4
F3
F2
F1
F0
C
VDD
E3
E2
E1
E0
D
OSC OUT
OSC IN
AC
TEST
Vss
X1
C2 100P
C3 100P
C4 0.001
C1 100/10
R3 2.2K
Q1 2SD636
R5 470
R4 47
Q2 2SB822
R1 1.2
R2 1.2
LED1
LED2
LED1,2 SLR-932A-1-A

## 3.26 RF CONVERTER AND RF SWITCH SCHEMATIC DIAGRAM

**NOTES:**
1. All parts shown in this schematic are critical for safety.
2. This schematic is only for reference.
Avoid replacing individual parts.
Replace the entire unit only.



TV
BST +B
VTR
ANT
MOD +B
AUDIO
VIDEO
GND
IC1 LA7054
Q1 2SC2480
Q51 2SC3357
Q52 2SC3357
Q53 2SC3357
D1 HZ5C1
D2 HSM276
D51 1SS119
X1 CSB500E54
SW1 (TSG SW)
SW2
SW3 (ATT SW)
ON
OFF
VR1 1K
T1
T2
T3
C72 1000P
C70 56P
L62
L61
L60
C69 0~22 (0) 1000P
R67 330~470 (390)
R65 68
R64 0~22 (10)
R66 0
L58
R63 1.8K
C66 1000P
C67 8P~15P (12P)
R62 15
C65 2200P
L59
C79 1000P
R69 2.7K
C74 1000P
L57
C78 1P
R61 560
R76 33~56 (47)
R60 180~270 (220)
C62 1000P
C63 0~5P (3P)
C64 2200P
C71 2200P
L56
R59 (Open)
C59 1000P
R58 0
C61 0~1000P (0)
C60 0~5P (3P)
R56 120
L55
C76 10P~15P (12P)
C73 0.47μ
R55 15
R57 1.5K~3.3K (2.2K)
C58 1000P
R54 560
C77 5P~8P (6P)
R75 47~68 (56)
R52 33~82 (56)
R53 120~390 (180)
C56 1000P
C57 0~5P (1P)
R51 10~56 (33)
C55 0~5P (0.5P)
L53
C52 33P~68P (56P)
L52
C53 120P
C51 33P~56P (47P)
L51
L63
C75 1000P
R73 22~56 (27)
R74 82~120 (100)
R15 82~120 (100)
R14 47~68 (56)
R13 0
C23 2P~5P (3P)
L1
C13 2P~5P (3P)
R72 10~18 (15)
R70 150~270 (180)
R71 1.2K
R68 10~22 (15)
C12 82P~120P (100P)
C11 82P~120P (100P)
R16 Open
C18 1000P
L4
R23 Open
C15 1P
R22 220~390 (330)
C19 100P
R20 18K
C17 150P
R21 2.7K
L3
L2
C16 6P~10P (8P)
CT1
C14 1P
R11 1.2K~3.3K (2.2K)
R12 5.6K~Open (10K)
R10 1.5K~4.7K (3.9K)
C10 33P~150P (47P)
C20 120P
C9 0.01μ
R7 2.2K
C8 120P
R6 10K
R5 22K~51K
R4 10K
R9 470K
R2 0
C7 4.7μ
R3 56K
C5 1000P
R8 12K
C22 1000P
C21 1000P
R1 180
C1 1000P
C3 100P
C4 1μ
C6 12P

# SECTION 4
# EXPLODED VIEWS AND PARTS LIST

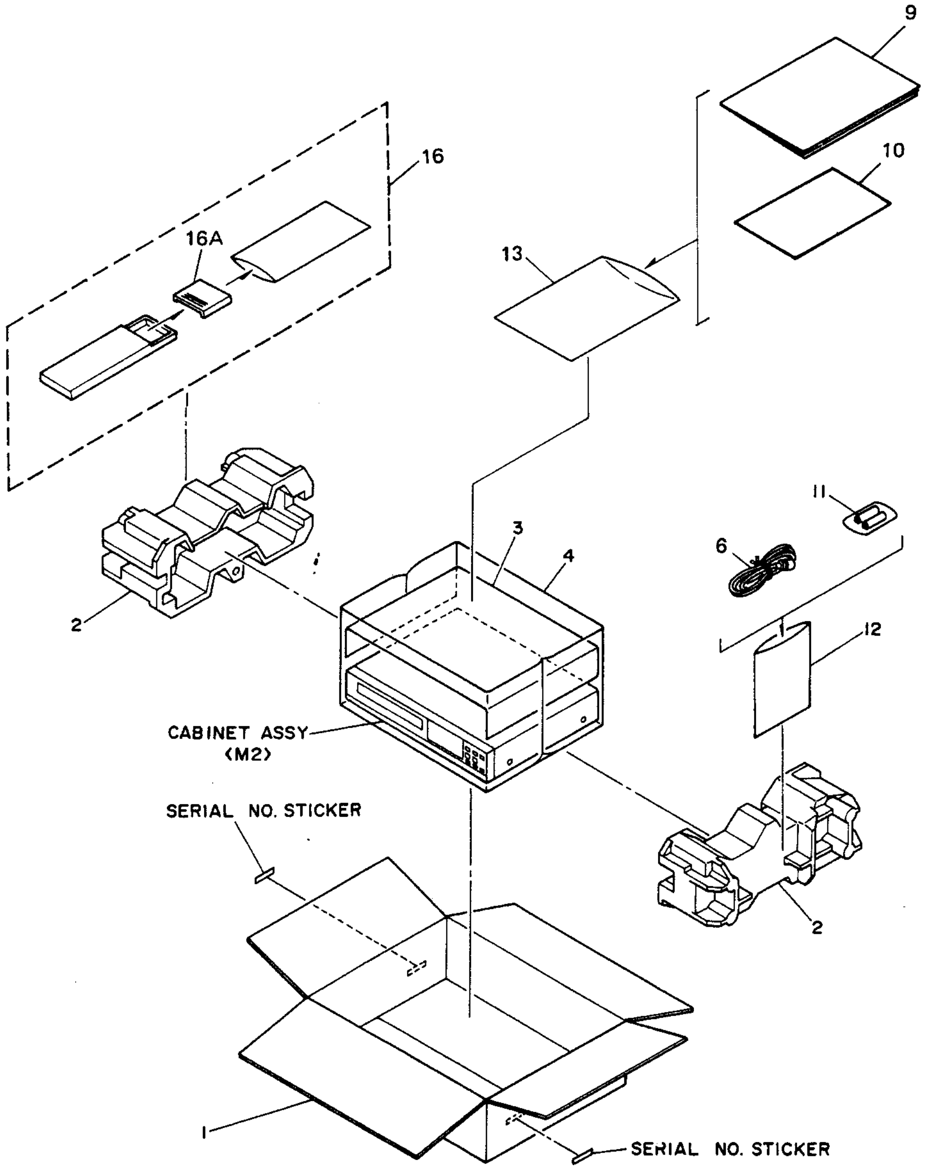
## SAFETY PRECAUTION

**Parts identified by the ⚠ symbol are critical for safety. Replace only with specified part numbers.**

**NOTE :**

[M ] indicates mechanical symbol number.

### 4.1 PACKING ASSEMBLY < M1 >

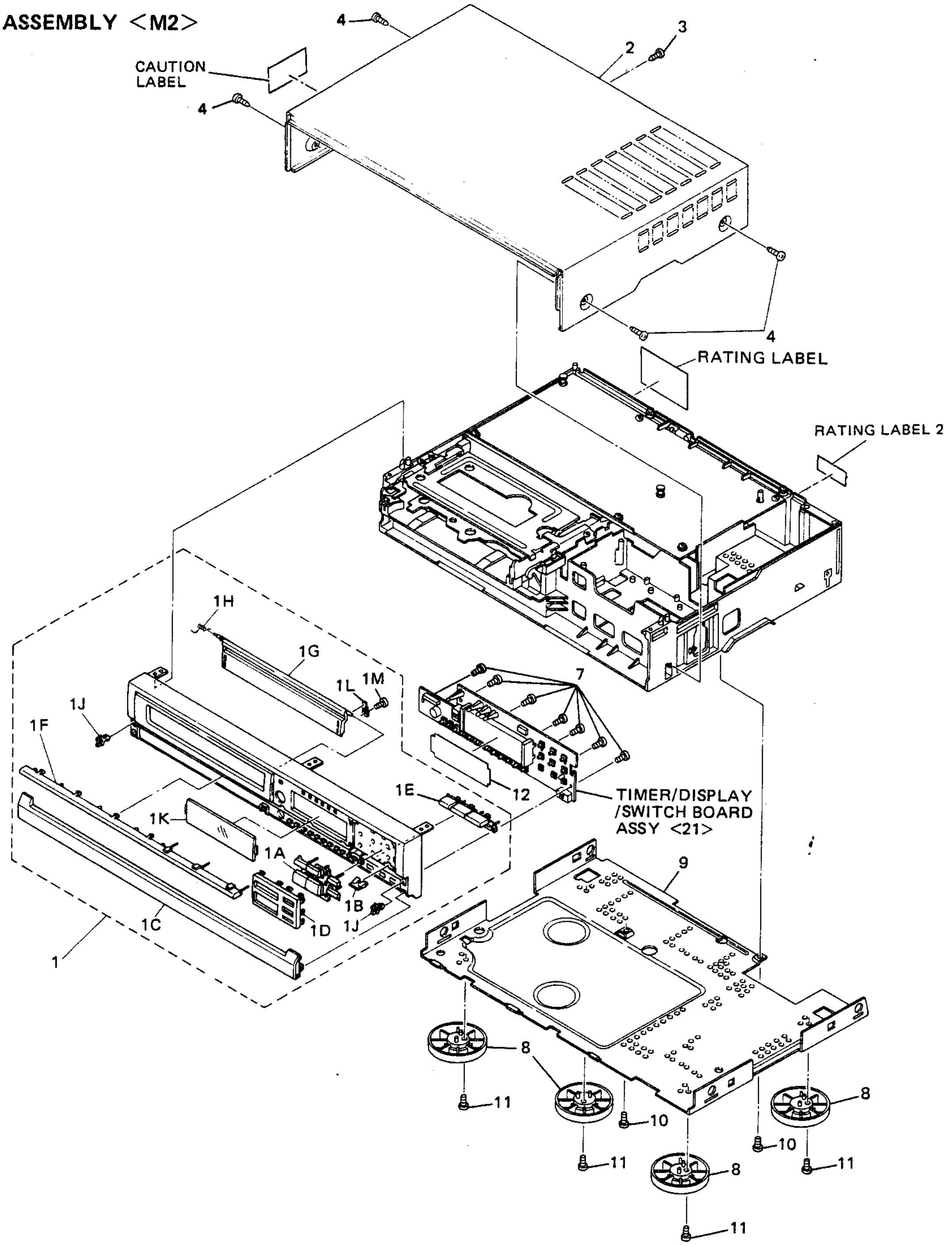

9
10
16
16A
13
11
6
3
4
2
12
CABINET ASSY
<M2>
SERIAL NO. STICKER
2
1
SERIAL NO. STICKER

************************************

### PACKING ASSEMBLY < M1 >

| #⚠ REF No. | PART No. | PART NAME, DESCRIPTION |
|---|---|---|
| 1 | PQ32790-205 | PACKING CASE |
| 2 | PQ33275A-1 | CUSHION ASSY |
| 3 | PQ41026-20 | PROTECT SHEET |
| 4 | PQM30021-59-11 | POLY BAG |
| 6 | PU59168-3 | RF CABLE |
|  | or PU59167-3 | RF CABLE |
| 9 | PU30425-1166 | INSTRUCTIONS |
| 10 | TCN-3379 | TAPE CATALOG |
| 11 | UM-3DJ2P | BATTERY,X2,CELLS |
| 12 | QPGA020-02005 | POLY BAG |
| 13 | QPGA025-03505 | POLY BAG |
| ⚠ 16 | PQ10344CG | REMOTE CONTROLLER |
| 16A | PQ31323 | BATTERY CAP |

## 4.2 CABINET ASSEMBLY <M2>

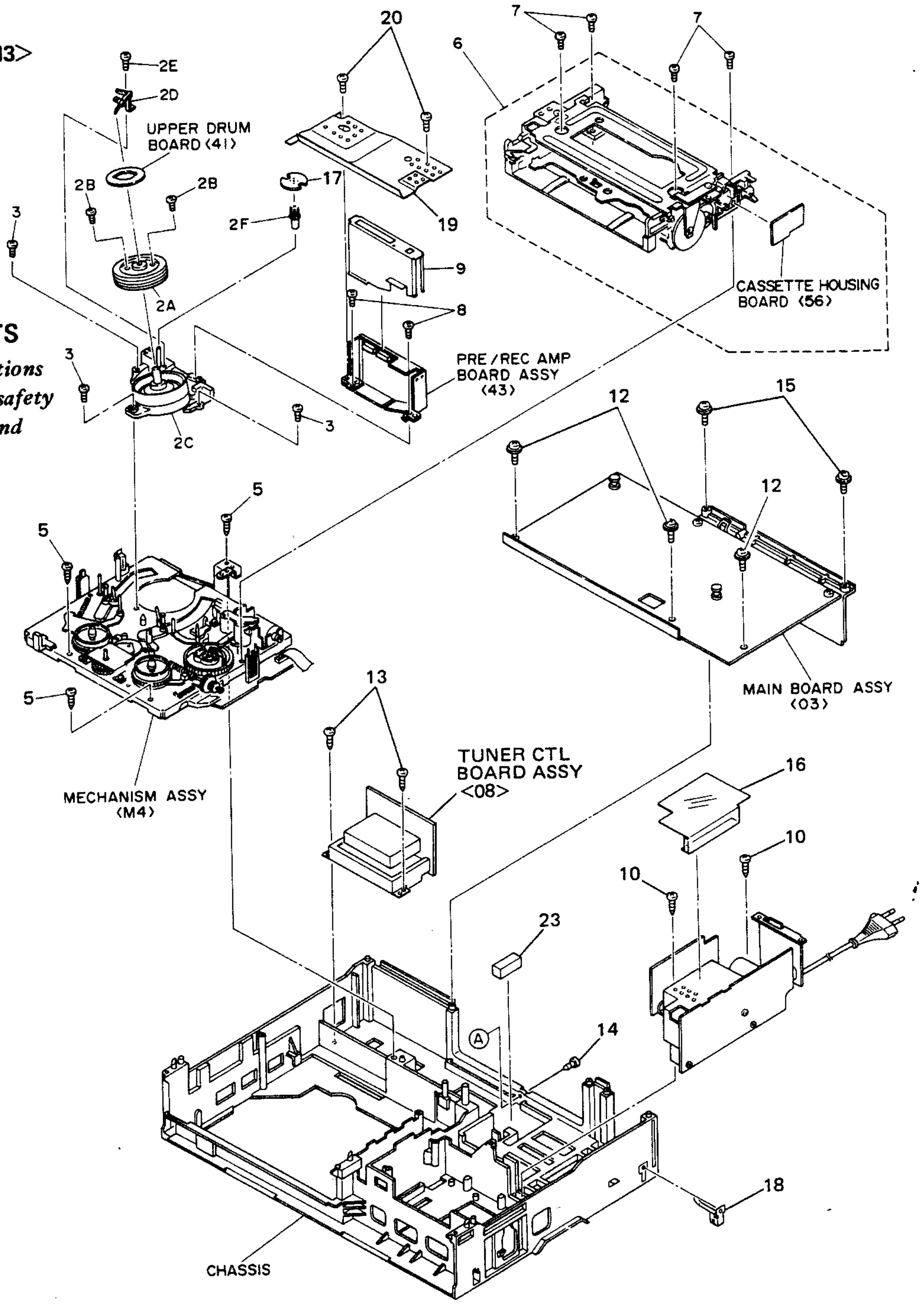

4
CAUTION LABEL
4
3
2
4
RATING LABEL
RATING LABEL 2
1H
1G
1L
1M
1J
1F
7
1E
12
TIMER/DISPLAY /SWITCH BOARD ASSY <21>
1K
1A
9
1B
1C
1D
1J
1
8
11
10
8
11
10
11
8
11

*****************************************

### CABINET ASSEMBLY <M2>

| #⚠ | REF No. | PART No. | PART NAME, DESCRIPTION |
|---|---|---|---|
| | 1 | PQ10889K | FRONT PANEL ASSY |
| | 1A | PQ32990-3 | BUTTON(OP.) |
| | 1B | PQ44062-1-2 | INDICATOR |
| | 1C | PQ20892K | DOOR ASSY |
| | 1D | PQ32991-3 | COVER(OP.) |
| | 1E | PQ32993-3 | HINGE(OP.) |
| | 1F | PQ20888-2 | COVER(1) |
| | 1G | PQ20890-5-6 | CASSETTE HOUSING DOOR |
| | 1H | PQ43628-1-1 | TORSION SPRING |
| | 1J | PU60109 | CATCHER |
| | 1K | PQ32992-3-3 | DISPLAY WINDOW |
| | 1L | PQ44389 | BRACKET |
| | 1M | SDSF2005Z | SCREW |
| ⚠ | 2 | PQ10602-11 | TOP COVER |
| | 3 | SDSF3010M | SCREW,FOR TOP COVER |
| | 4 | PQ43827 | SPECIAL SCREW,X4,FOR TOP COVER |
| | 7 | SDSF2608Z | SCREW,X7,FOR T/D/S BOARD |
| | 8 | PQ43456B-1 | FOOT ASSY,X4 |
| ⚠ | 9 | PQ10712-1-5 | BOTTOM COVER |
| | 10 | SDSF3012Z | SCREW,X2,FOR BOTTOM COVER |
| | 11 | SDSF3012Z | SCREW,X4,FOR FOOT |
| | 12 | PQ43850-2-5 | FILTER(FDP) |

## 4.3 CHASSIS ASSEMBLY <M3>


2E
2D
UPPER DRUM BOARD <41>
2B
2B
3
2F
17
2A
3
2C
3
20
19
9
8
PRE/REC AMP BOARD ASSY <43>
7
7
6
CASSETTE HOUSING BOARD <56>
12
15
12
MAIN BOARD ASSY <03>
5
5
5
MECHANISM ASSY <M4>
13
TUNER CTL BOARD ASSY <08>
16
10
10
23
A
14
18
CHASSIS

### BEWARE OF BOGUS PARTS

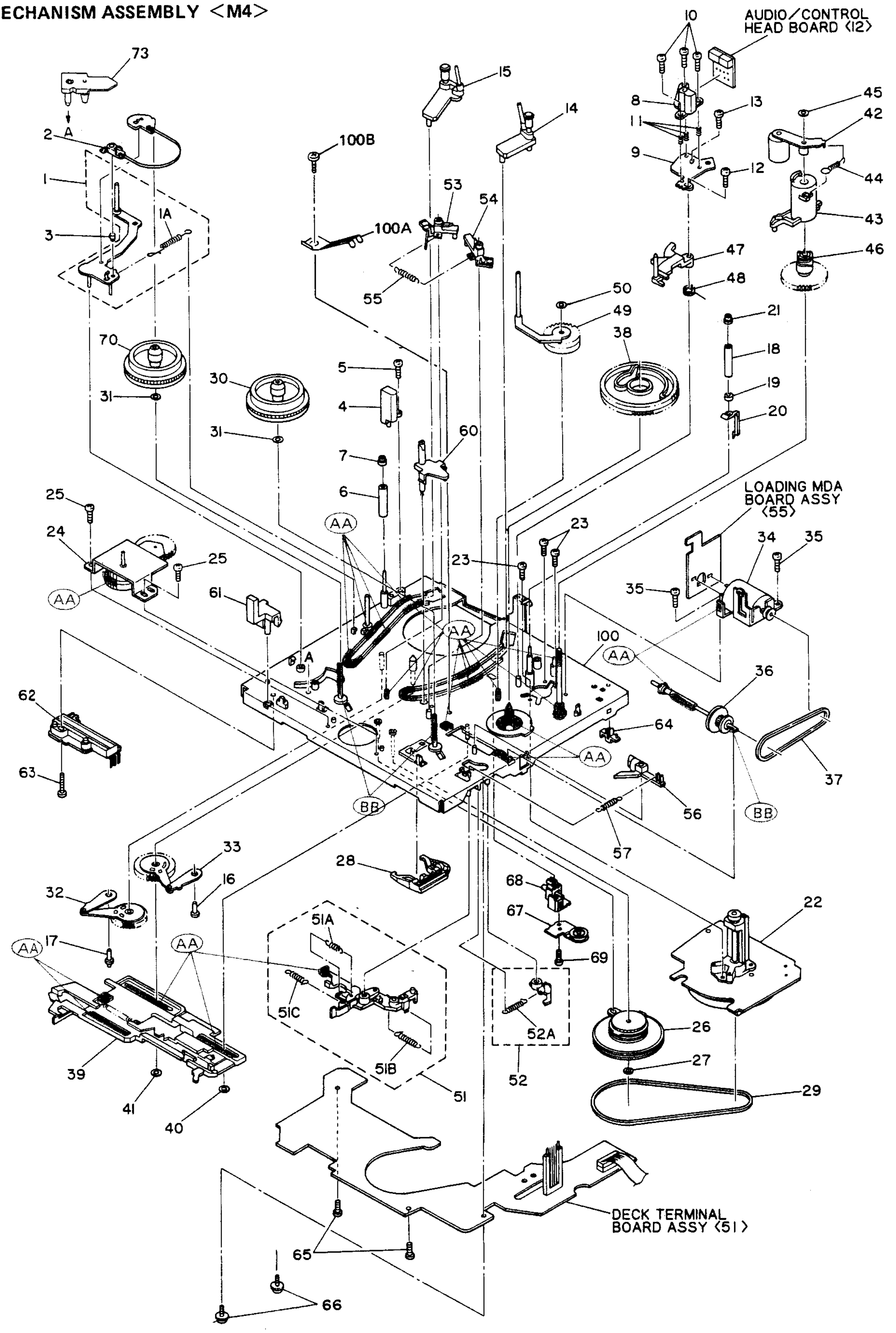
*Parts that do not meet specifications may cause trouble in regard to safety and performance. We recommend that genuine JVC parts be used.*

***********************************

### CHASSIS ASSEMBLY <M3>

| #⚠ | REF No. | PART No. | PART NAME, DESCRIPTION |
|---|---|---|---|
| ⚠ | 1 | PQ10764-1-4 | BOTTOM CHASSIS |
| | 2A | PDM2008B-5 | UPPER DRUM ASSEMBLY |
| | 2B | PDM4165A | DRUM SCREW ASSEMBLY, X2 |
| | 2C | PDM2138G | LOWER DRUM MOTOR ASSEMBLY |
| | 2D | PDM4229A-1 | BRUSH ASSY |
| | 2E | SPSG2606Z | SCREW,FOR BRUSH ASSEMBLY |
| | 2F | PDM4226A | ROLLER ASSY |
| | 3 | SPST2610Z | SCREW,X3,FOR DRUM |
| | 5 | PQ43831 | SPECIAL SCREW,X3,FOR MAIN DECK |
| | 6 | PUS29183B-7 | CASSETTE HOUSING ASSY |
| | 7 | SDST2608Z | SCREW,X4,FOR CASSETTE HOUSING |
| | 8 | SDSG2606Z | SCREW,X2,FOR PRE/REC |
| | 9 | PQ32217-1-1 | SHIELD CASE(2),FOR PRE/REC |
| | 10 | PQ43831 | SPECIAL SCREW,X2,FOR P.TRANS |
| | 12 | GPSF2610Z | SCREW,X3,FOR MAIN BOARD |
| | 13 | SDSF3008Z | SCREW,X2,FOR TUNER UNIT |
| | 14 | SDSF3010M | SCREW,FOR TEARMINAL BOARD |
| | 15 | GPSF2610Z | SCREW,X2,FOR TEARMINAL BOARD |
| ⚠ | 16 | PQ44631 | AC COVER |
| | 17 | PQ44230 | INERTIA PLATE |
| ⚠ | 18 | PQ44679 | EARTH PLATE |
| | 19 | PQ32387-1-4 | DRUM SHIELD |
| | 20 | SDST2608Z | SCREW,X2,FOR DRUM SHIELD |
| | 23 | PQM30029-127 | SPACER,FOR CHASSIS |

## 4.4 MECHANISM ASSEMBLY <M4>


73
2
A
1
3
1A
70
31
30
31
100B
100A
53
54
55
15
14
5
4
7
6
60
50
49
38
10
AUDIO/CONTROL HEAD BOARD <12>
8
13
11
9
12
47
48
21
18
19
20
45
42
44
43
46
25
24
25
AA
61
AA
23
23
AA
A
LOADING MDA BOARD ASSY <55>
34
35
35
100
AA
36
37
62
63
64
AA
56
BB
57
BB
33
16
32
AA
17
AA
28
68
67
69
51A
51C
51B
51
52A
52
22
26
27
29
39
41
40
DECK TERMINAL BOARD ASSY <51>
65
66

| Category | Part number | MARK |
|---|---|---|
| Grease | KANTO-G-31KAV | (AA) |
| Oil | COSMO-HV56 | (BB) |

**NOTE:** The section marked in (AA) and (BB) indicate lubrication and greasing areas.

******************************

## MECHANISM ASSEMBLY <M4>

| #⚠ | REF No. | PART No. | PART NAME, DESCRIPTION |
|---|---|---|---|
|  | 1 | PQ43497E-8 | TENSION ARM ASSY |
|  | 1A | PQ43500 | TENSION SPRING |
|  | 2 | PQ43501B | TENSION BAND ASSY |
|  | 3 | PQ43503-1-4 | ADJUST PIN |
|  | 4 | PU60616 | FULL ERASE HEAD |
|  | 5 | SDSF2614Z | SCREW |
|  | 6 | PQ43505-1-1 | ROLLER |
|  | 7 | PQ43506 | GUIDE POLE CAP |
|  | 8 | PU60617 | AUDIO/CONTROL HEAD |
|  | 9 | PQ43509 | HEAD BASE |
|  | 10 | PQ43687A | SPECIAL SCREW,X3 |
|  | 11 | PQM30002-192 | COMPRESSION SPRING,X3 |
|  | 12 | SPSP2606Z | SCREW |
|  | 13 | SPSF2608M | SCREW |
|  | 14 | PU61103-2 | POLE BASE ASSY(TU) |
|  | 15 | PU61151-2 | POLE BASE ASSY(SUPPLY) |
|  | 16 | PQ43524 | STOPPER |
|  | 17 | PQ43525 | STOPPER 2 |
|  | 18 | PQ43526-1-3 | TAPE GUIDE |
|  | 19 | PQ43670-1-1 | GUIDE FLANGE |
|  | 20 | PQ43675 | TAPE GUARD |
|  | 21 | PQ43506 | GUIDE POLE CAP |
| ⚠ | 22 | PU61003-1-2 | CAPSTAN MOTOR |
|  | 23 | SPSG2608Z | SCREW,X3 |
|  | 24 | PU61004-1-3 | IDLER GEAR UNIT |
|  | 25 | SPST2606Z | SCREW,X2 |
|  | 26 | PU61005-1-4 | CLUTCH UNIT |
|  | 27 | PQM30017-8 | SLIT WASHER |
|  | 28 | PQ43532A-1 | CHANGE LEVER ASSY |
|  | 29 | PU61006 | TIMING BELT |
|  | 30 | PU60858 | REEL DISK (TAKE-UP) |
|  | 31 | PQM30018-54 | SPACER,X2 |
|  | 32 | PQ43537A | LOADING ARM ASSY (SUPPLY) |
|  | 33 | PQ43542B | LOADING ARM ASSY (TAKE-UP) |
|  | 34 | PQ43676B-5 | MODE MOTOR ASSY |
|  |  | or PQ43676C | MODE MOTOR ASSY |
|  | 35 | SPST2606Z | SCREW,X2 |
|  | 36 | PQ43548A-3 | WORM CLUTCH ASSY |
|  | 37 | PQM30003-23 | BELT(LOADING) |
|  | 38 | PQ20822-2-4 | CONTROL CAM |
|  | 39 | PQ44326A-3 | PLATE ASSY |
|  | 40 | PQM30017-12 | SLIT WASHER |
|  | 41 | PQM30017-8 | SLIT WASHER |
|  | 42 | PQ43921B-2 | PINCH ROLLER ARM ASSY |
|  |  | or PQ43921D-2 | PINCH ROLLER ARM ASSY |
|  | 43 | PQ32415 | PINCH ROLLER PRESS LEVER |
|  | 44 | PQM30001-233 | TENSION SPRING |
|  | 45 | PQM30017-12 | SLIT WASHER |
|  | 46 | PQ32416-2 | PINCH ROLLER CAM |
|  | 47 | PQ43567A-8 | GUIDE ARM ASSY |
|  | 48 | PQ43569-1-3 | TORSION SPRING |
|  | 49 | PQ43570A | HALF LOADING GEAR ASSY |
|  | 50 | PQM30017-12 | SLIT WASHER |
|  | 51 | PQ43575A-5 | CANCEL LEVER ASSY |
|  | 51A | PQM30001-273 | TENSION SPRING |
|  | 51B | PQM30001-237 | TENSION SPRING |
|  | 51C | PQM30001-274 | TENSION SPRING |
|  | 52 | PQ43578A-2 | HOOK ASSY |
|  | 52A | PQM30001-238 | TENSION SPRING |
|  | 53 | PQ43581A-6 | MAIN BRAKE ASSY (SUPPLY) |
|  | 54 | PQ43582A-2 | MAIN BRAKE ASSY (TAKE-UP) |
|  | 55 | PQM30001-251 | TENSION SPRING |
|  | 56 | PQ43583A | SUB BRAKE ASSY (TAKE-UP) |
|  | 57 | PQM30001-298 | TENSION SPRING |
|  | 60 | PU60621-1-2 | LED HOLDER(INCL.LED:D1) |
|  | 61 | PU60624-1-4 | REC SAFETY SWITCH(S2) |
|  | 62 | PU60973 | SLIDE SWITCH(S3) |
|  | 63 | SDSF2614Z | SCREW |
|  | 64 | PQ32516 | PWB HOLDER |
|  | 65 | SDST2616Z | SCREW,X2 |
|  | 66 | GPSF2608Z | SCREW,X2 |
|  | 67 | PQ43912A-5 | PULLEY ARM ASSY |
|  | 68 | PQ32882 | PULLEY BASE |
|  | 69 | SDSF2608Z | SCREW |
|  | 70 | PU60859-1-4 | REEL DISK (SUPPLY) |
|  | 73 | PQ44246 | TENSION BRACKET 3 |
|  | 100 | PQ20650E-18 | MAIN DECK ASSY |
|  |  | or PQ20753D | MAIN DECK ASSY |
|  | 100A | PQ43849 | EARTH PLATE |
|  | 100B | SPST2604Z | SCREW |

# SECTION 5
# ELECTRICAL PARTS LIST

## SAFETY PRECAUTION

**Parts identified by the ⚠ symbol are critical for safety. Replace only with specified part numbers.**

| #⚠ | REF No. | PART No. | PART NAME, DESCRIPTION |
|---|---|---|---|

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### POWER TRANSFORMER BOARD ASSY<01><02>

| #⚠ | REF No. | PART No. | PART NAME, DESCRIPTION |
|---|---|---|---|
|  | PWBA | PB20439A-04 | POWER SUPPLY BOARD ASSEMBLY |
| ⚠ | POC1 | QMP3980-200 | POWER CORD |
| ⚠ | BKT1 | PQ20971 | TRANS BRACKET |
| ⚠ | HD1 | QHS3771-108 | STRAIN RELIEF |
|  | SCW1 | SDST3006Z | SCREW,X4 |
|  | SLD1 | PQ33261-1-1 | SHIELD CASE (1) |
|  | SLD2 | PQ33262 | SHIELD CASE (2) |

### – SWITCH REGULATOR BOARD ASSEMBLY<01> –

| #⚠ | REF No. | PART No. | PART NAME, DESCRIPTION | |
|---|---|---|---|---|
|  | PWBA1 | PB20439A1-04 | SW.REGULATOR BOARD ASSEMBLY | |
|  | IC1 | LM358N | IC | |
|  |  | or LM358P | IC | |
|  |  | or BA10358 | IC | |
|  | Q1 | 2SC4517A-LF619 | TRANSISTOR | |
|  | Q2 | 2SC3616(MLK) | TRANSISTOR | |
|  | Q5 | 2SB941P | TRANSISTOR | |
|  | D1 | 10E6-F2 | DIODE | |
|  | D2 | 10E6-F2 | DIODE | |
|  | D3 | 10E6-F2 | DIODE | |
|  | D4 | 10E6-F2 | DIODE | |
|  | D5 | AU01 | FR DIODE | |
|  | D6 | AU01 | FR DIODE | |
|  | D7 | MTZ27BT-77 | ZENER DIODE | |
|  | D8 | AU01Z | FR DIODE | |
|  |  | or ERA48-02 | FR DIODE | |
|  | D14 | AU01Z | FR DIODE | |
|  |  | or ERA48-02 | FR DIODE | |
|  | D15 | 11EFS2 | FR DIODE | |
|  | D16 | FML-12S | FR DIODE | |
|  |  | or F6P20F | FR DIODE | |
|  | D17 | FMB-24 | BARRIER DIODE | |
|  |  | or F5KQ40B | BARRIER DIODE | |
|  | D18 | AU01Z | FR DIODE | |
|  |  | or ERA48-02 | FR DIODE | |
|  | D19 | MTZ30AT-77 | ZENER DIODE | |
|  | D20 | RD8.2ES-T1B1 | ZENER DIODE | |
|  |  | or UZ8.2BSA | ZENER DIODE | |
|  | D21 | AK04 | DIODE | |
|  | D22 | MTZV6.2A | ZENER DIODE | |
|  | D23 | AK04 | DIODE | |
|  | D29 | RD15ES-T1B1 | ZENER DIODE | |
|  | R1 | QRZ0078-2R2 | W.W.RESISTOR | 2.2Ω |
|  | R2 | QRD161J-334 | RESISTOR | 330KΩ,1/6W |
|  | R3 | QRD161J-334 | RESISTOR | 330KΩ,1/6W |
|  | R4 | QRD161J-563 | RESISTOR | 56KΩ,1/6W |
|  | R5 | QRG029J-683G | OMF RESISTOR | 68KΩ,2W |
|  | R6 | QRG029J-241G | OMF RESISTOR | 240Ω,2W |
|  | R7 | QRD161J-122 | RESISTOR | 1.2KΩ,1/6W |
|  | R8 | QRD161J-471 | RESISTOR | 470Ω,1/6W |
|  | R9 | QRX014J-R33 | MF RESISTOR | 0.33Ω,1W |
|  | R10 | QRG029J-303A | OMF RESISTOR | 30KΩ,2W |
|  | R17 | QRD161J-221 | RESISTOR | 220Ω,1/6W |
|  | R18 | QRD161J-102 | RESISTOR | 1KΩ,1/6W |
|  | R19 | QRV144F-1071A | CMF RESISTOR | 1.07KΩ,1/4W |
|  | R20 | QRV144F-1001A | CMF RESISTOR | 1KΩ,1/4W |
| ⚠ | R21 | QRZ0077-470X | FUSIBLE RESISTOR | 47Ω |
|  | R22 | QRD161J-333 | RESISTOR | 33KΩ,1/6W |
|  | R23 | QRD161J-471 | RESISTOR | 470Ω,1/6W |
|  | R24 | QRV144F-4023A | RESISTOR | 402KΩ,1/4W |
|  | R25 | QRV144F-1002A | CMF RESISTOR | 10.0KΩ,1/4W |
|  | R26 | QRV144F-1182A | CMF RESISTOR | 11.8KΩ,1/4W |
|  | R28 | QRD161J-331 | RESISTOR | 330Ω,1/6W |
|  | R29 | QRD161J-103 | RESISTOR | 10KΩ,1/6W |
| ⚠ | C1 | QFZ9022-333 | MM CAPACITOR | 0.033μF |
| ⚠ | C2 | QFZ9022-333 | MM CAPACITOR | 0.033μF |
| ⚠ | C3 | QFZ9022-333 | MM CAPACITOR | 0.033μF |
| ⚠ | C6 | QCZ9016-222M | CAPACITOR | 0.0022μF |
| ⚠ | C7 | QCZ9016-222M | CAPACITOR | 0.0022μF |

| #⚠ REF No. | PART No. | PART NAME, DESCRIPTION | |
|---|---|---|---|
| ⚠ C8 | QCZ9016-222M | CAPACITOR | 0.0022μF |
| ⚠ C9 | QCZ9016-222M | CAPACITOR | 0.0022μF |
| ⚠ C10 | QCZ9016-222M | CAPACITOR | 0.0022μF |
| ⚠ C11 | QCZ9016-222M | CAPACITOR | 0.0022μF |
| C12 | QEZ0147-107 | E CAPACITOR | 100μF |
| | or QEZ0111-107 | E CAPACITOR | 100μF |
| C13 | QCY53AK-472 | CAPACITOR | 0.0047μF,1000V |
| | or QCZ0212-472 | CAPACITOR | 0.0047μF |
| C14 | QCZ0212-101 | CAPACITOR | 100PF |
| C16 | QFL41HJ-682 | M CAPACITOR | 0.0068μF,50V |
| C17 | QETC1HM-475 | E CAPACITOR | 4.7μF,50V |
| C18 | QETC1JM-336 | E CAPACITOR | 33μF,63V |
| C19 | QEZ0125-477 | E CAPACITOR | 470μF |
| | or QEZ0138-477 | E CAPACITOR | 470μF |
| C20 | QETC1EM-337 | E CAPACITOR | 330μF,25V |
| C21 | QEMB1CM-158 | E CAPACITOR | 1500μF,16V |
| C22 | QETB1CM-108 | E CAPACITOR | 1000μF,16V |
| C23 | QFL41HJ-102 | M CAPACITOR | 0.001μF,50V |
| C24 | QEZ0136-228 | E CAPACITOR | 2200μF |
| | or QEZ0106-228 | E CAPACITOR | 2200μF |
| C25 | QETC1HM-476 | E CAPACITOR | 47μF,50V |
| C26 | QETC1VM-336 | E CAPACITOR | 33μF,35V |
| C27 | QFL41HJ-103 | M CAPACITOR | 0.01μF,50V |
| C28 | QEZ0156-127Z | E CAPACITOR | 120μF |
| | or QEZ0135-127Z | E CAPACITOR | 120μF |
| C29 | QETC0JM-107 | E CAPACITOR | 100μF,6.3V |
| C30 | QFL41HJ-103 | M CAPACITOR | 0.01μF,50V |
| C50 | QFL41HJ-122 | M CAPACITOR | 0.0012μF,50V |
| ⚠ C52 | QCZ9016-101K | CAPACITOR | 100PF |
| ⚠ C53 | QCZ9016-101K | CAPACITOR | 100PF |
| C55 | QFV11HJ-124 | MMT CAPACITOR | 0.12μF,50V |
| L1 | PU60943-330K | COIL | 33μH |
| L2 | PU60943-100M | COIL | 10μH |
| L3 | PU60943-330K | COIL | 33μH |
| L4 | PU48530-101K | COIL | 100μH |
| ⚠ PHS1 | PC111S | PHOTO COUPLER | |
| ⚠ T1 | PELN0301 | SWITCHING TRANS | |
| ⚠ HD1 | PU57505 | FUSE CLIP,X2 | |
| ⚠ HS1 | PQ44610-1-1 | HEAT SINK,FOR Q1 | |
| ⚠ HS2 | PQ44724 | HEAT SINK,FOR D16,D17 | |
| ⚠ LF1 | PU61108 | LINE FILTER | |
| ⚠ | or PU60347 | LINE FILTER | |
| ⚠ LF2 | PU59707 | LINE FILTER | |
| ⚠ | or PELN0255 | LINE FILTER | |

| #⚠ REF No. | PART No. | PART NAME, DESCRIPTION | |
|---|---|---|---|
| SCW1 | SDSG3008Z | SCREW | |
| ⚠ SCW2 | SDSG3006Z | SCREW | |
| SCW3 | SDSG3008Z | SCREW,X2,FOR D16,D17 | |
| SCW4 | SDSG3006Z | SCREW, FOR HEAT SINK | |
| ⚠ SLD1 | PQ44698 | INSULATOR | |
| SPC1 | PU57215-2 | SPACER | |
| ⚠ TAB1 | A74316 | TAB,X2 | |
| CN1 | PU58844-104 | CAP HOUSING, PIN 4-7 | |
| CN2 | PU58844-8 | CAP HOUSING, PIN 2-9 | |
| ⚠ CP1 | ICP-N5 | CIRCUIT PROTECTOR | |
| ⚠ CP2 | ICP-N20 | CIRCUIT PROTECTOR | |
| ⚠ F1 | QMF51E2-1R0 | FUSE | T1.0A,AC250V |
| ⚠ | or QMF51E2-1R0J1 | FUSE | T1.0A,AC250V |

### – REGULATOR BOARD ASSEMBLY<02> –

| | | | |
|---|---|---|---|
| PWBA2 | PB20439A2-04 | REGULATOR BOARD ASSEMBLY | |
| IC2 | UPC24M05HF | IC | |
| Q7 | 2SB1425(EU) | TRANSISTOR | |
| Q8 | 2SC1740S | TRANSISTOR | |
| Q9 | 2SB941P | TRANSISTOR | |
| Q10 | 2SC1740S(Q) | TRANSISTOR | |
| Q11 | 2SC1740S | TRANSISTOR | |
| Q12 | 2SA933S | TRANSISTOR | |
| | or 2SA1267(YG)-TJK | TRANSISTOR | |
| D24 | 11ES2 | DIODE | |
| | or ERA15-02 | DIODE | |
| D25 | 1SS133 | DIODE | |
| | or MA165 | DIODE | |
| D26 | UZ5.1BSC | ZENER DIODE | |
| | or RD5.1ES-T1B3 | ZENER DIODE | |
| | or MTZV5.1C | ZENER DIODE | |
| R31 | QRD161J-102 | RESISTOR | 1KΩ,1/6W |
| R32 | QRD161J-103 | RESISTOR | 10KΩ,1/6W |
| R33 | QRD161J-221 | RESISTOR | 220Ω,1/6W |
| R34 | QRD161J-822 | RESISTOR | 8.2KΩ,1/6W |
| R35 | QRD161J-471 | RESISTOR | 470Ω,1/6W |
| R36 | QRD161J-103 | RESISTOR | 10KΩ,1/6W |
| R37 | QVZ3518-471AZ | V RESISTOR,DC 5V | 470Ω |
| | or QVZ3523-471AZ | V RESISTOR | 470Ω |
| R38 | QRD161J-472 | RESISTOR | 4.7KΩ,1/6W |
| R39 | QRD161J-102 | RESISTOR | 1KΩ,1/6W |

| #⚠ | REF No. | PART No. | PART NAME, DESCRIPTION | |
|---|---|---|---|---|
| | R40 | QRD161J-103 | RESISTOR | 10KΩ,1/6W |
| ⚠ | R41 | QRZ0077-220X | FUSIBLE RESISTOR | 22Ω |
| | R51 | QRD161J-102 | RESISTOR | 1KΩ,1/6W |
| | R52 | QRD161J-222 | RESISTOR | 2.2KΩ,1/6W |
| | C34 | QETC1JM-226 | E CAPACITOR | 22μF,63V |
| | C35 | QETC1CM-107 | E CAPACITOR | 100μF,16V |
| | C36 | QETC0JM-107 | E CAPACITOR | 100μF,6.3V |
| | C37 | QETC1CM-107 | E CAPACITOR | 100μF,16V |
| | C38 | QETC1AM-107 | E CAPACITOR | 100μF,10V |
| | C39 | QETB1AM-228 | E CAPACITOR | 2200μF,10V |
| | C40 | QFL41HJ-103 | MY CAPACITOR | 0.01μF,50V |
| | C41 | QETC0JM-107 | E CAPACITOR | 100μF,6.3V |
| | C43 | QFL41HJ-103 | MY CAPACITOR | 0.01μF,50V |
| | C44 | QETC0JM-107 | E CAPACITOR | 100μF,6.3V |
| | C51 | QETC1CM-476 | E CAPACITOR | 47μF,16V |
| | TP1 | PU54983 | TEST PIN,X3,(TP1-3) | |
| | CN3 | PU58844-108 | CAP HOUSING, PIN 2-9 | |
| | CN4 | PU60910-112 | CAP HOUSING | |
| ⚠ | CP3 | ICP-N20 | CIRCUIT PROTECTOR | |
| ⚠ | CP4 | ICP-N38 | CIRCUIT PROTECTOR | |
| ⚠ | CP5 | ICP-N38 | CIRCUIT PROTECTOR | |

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## MAIN BOARD ASSEMBLY<03>

| #⚠ | REF No. | PART No. | PART NAME, DESCRIPTION | |
|---|---|---|---|---|
| | PWBA | PB10350V | MAIN BOARD ASSEMBLY | |
| ⚠ | RF1 | PU60384-1-1 | RF CONVERTER/MIX BOOSTER | |
| | SPC1 | PU60010 | SPACER,X2 | |
| ⚠ | TB1 | PQ20776-27 | TERMINAL BOARD | |
| | BKT1 | PQ32369 | BRACKET | |
| | CL1 | PEME0767 | WIRE HOLDER | |
| | CL2 | PU59311-3 | WIRE CLAMP | |
| | CL3 | PU55379 | MINI CLAMP | |
| | CL4 | PU59311-4 | WIRE CLAMP | |
| | CL5 | PU59311-2 | WIRE CLAMP | |
| | ETH1 | PQ43012-1-1 | EARTH PLATE,FOR RF CONV. | |
| | RV1 | PU56800 | NYLON RIVET | |
| | SCW1 | SDST2605Z | SCREW, RF CONV. | |
| | SCW2 | SDSF2608Z | SCREW,X2,FOR TERMINAL BOARD | |
| | WR1 | PW30401-BB20T | COAXIAL CORD,CONV.-TUN. | |
| | | or PW30401-BB20S | COAXIAL CORD,CONV.-TUN. | |
| | | or PW30402-BB20M | COAXIAL CORD,CONV.-TUN. | |
| | J701 | PU60192N | CONNECTOR BOARD | |
| | J702 | PU60612 | REMOTE PAUSE JACK | |
| | | or PU61012 | REMOTE PAUSE JACK | |
| | TP31 | PU57545 | TEST PIN,X14 | |

### - AUDIO SECTION -

| #⚠ | REF No. | PART No. | PART NAME, DESCRIPTION | |
|---|---|---|---|---|
| ⚠ | IC1 | BA7765AS | IC | |
| ⚠ | | or XRA7765AS | IC | |
| | Q1 | 2SC1740S(RS) | TRANSISTOR | |
| | | or 2SC3199(G)-TJK | TRANSISTOR | |
| | Q2 | 2SC1740S(RS) | TRANSISTOR | |
| | | or 2SC3199(G)-TJK | TRANSISTOR | |
| | Q3 | DTA114ES | TRANSISTOR | |
| | Q4 | 2SC1740S(RS) | TRANSISTOR | |
| | | or 2SC3199(G)-TJK | TRANSISTOR | |
| | Q5 | DTA124ES | TRANSISTOR | |
| | Q6 | DTA144ES | TRANSISTOR | |
| | D2 | 1SS133 | DIODE | |
| | | or MA165 | DIODE | |
| | D3 | RD5.1ES-T1B2 | ZENER DIODE | |
| | | or HZS5.1EB2 | ZENER DIODE | |
| | | or UZ5.1BSB | ZENER DIODE | |
| | R1 | QRD161J-473 | RESISTOR | 47KΩ,1/6W |
| | R2 | QRD161J-473 | RESISTOR | 47KΩ,1/6W |
| | R4 | QRD161J-242 | RESISTOR | 2.4KΩ,1/6W |
| | R5 | QRD161J-103 | RESISTOR | 10KΩ,1/6W |
| | R6 | QRD161J-222 | RESISTOR | 2.2KΩ,1/6W |
| | R7 | QRD161J-102 | RESISTOR | 1KΩ,1/6W |
| | R8 | QRD161J-102 | RESISTOR | 1KΩ,1/6W |
| | R9 | QRD161J-102 | RESISTOR | 1KΩ,1/6W |
| | R10 | QRD161J-100 | RESISTOR | 10Ω,1/6W |
| | R11 | QVZ3518-683AZ | V RESISTOR,BIAS ADJ | 68KΩ |
| | | or QVZ3523-683AZ | V RESISTOR | 68KΩ |

| # ⚠ | REF No. | PART No. | PART NAME, DESCRIPTION | |
|---|---|---|---|---|
| | R12 | QRD161J-153 | RESISTOR | 15KΩ,1/6W |
| | R13 | QRD161J-6R8 | RESISTOR | 6.8Ω,1/6W |
| | R15 | QRD161J-183 | RESISTOR | 18KΩ,1/6W |
| | R16 | QRD161J-181 | RESISTOR | 180Ω,1/6W |
| | R17 | QRD161J-274 | RESISTOR | 270KΩ,1/6W |
| | R18 | QRD161J-103 | RESISTOR | 10KΩ,1/6W |
| | R21 | QRD161J-183 | RESISTOR | 18KΩ,1/6W |
| | R22 | QRD162J-682 | RESISTOR | 6.8KΩ,1/6W |
| | R23 | QRD162J-622 | RESISTOR | 6.2KΩ,1/6W |
| | R24 | QRD161J-153 | RESISTOR | 15KΩ,1/6W |
| | R25 | QRD161J-153 | RESISTOR | 15KΩ,1/6W |
| | R26 | QRD161J-475 | RESISTOR | 4.7MΩ,1/6W |
| | R27 | QRD161J-475 | RESISTOR | 4.7MΩ,1/6W |
| | R28 | QRD161J-123 | RESISTOR | 12KΩ,1/6W |
| | R29 | QRD161J-333 | RESISTOR | 33KΩ,1/6W |
| | R30 | QRD161J-103 | RESISTOR | 10KΩ,1/6W |
| | R32 | QRD161J-333 | RESISTOR | 33KΩ,1/6W |
| | R34 | QRD161J-151 | RESISTOR | 150Ω,1/6W |
| | R36 | QRD161J-332 | RESISTOR | 3.3KΩ,1/6W |
| | R37 | QRD161J-273 | RESISTOR | 27KΩ,1/6W |
| | R40 | QRD161J-272 | RESISTOR | 2.7KΩ,1/6W |
| | R41 | QRD161J-475 | RESISTOR | 4.7MΩ,1/6W |
| | R45 | QRD161J-222 | RESISTOR | 2.2KΩ,1/6W |
| | R46 | QRD161J-472 | RESISTOR | 4.7KΩ,1/6W |
| ⚠ | R47 | QRZ0077-4R7X | FUSIBLE RESISTOR | 4.7Ω |
| | R49 | QRD161J-473 | RESISTOR | 47KΩ,1/6W |
| | C1 | QCBB1HJ-561 | CAPACITOR | 560PF,50V |
| | C2 | QCBB1HJ-561 | CAPACITOR | 560PF,50V |
| | C3 | QCC11EJ-272 | CAPACITOR | 0.0027μF,25V |
| | C4 | QCC11EJ-392 | CAPACITOR | 0.0039μF,25V |
| | C5 | QETC1EM-475 | E CAPACITOR | 4.7μF,25V |
| | C6 | QFL31HJ-152 | M CAPACITOR | 0.0015μF,50V |
| | C8 | PU60550-105 | E CAPACITOR | 1μF |
| | C9 | QETC1CM-106 | E CAPACITOR | 10μF,16V |
| | C10 | QFV71HJ-103 | TF CAPACITOR | 0.01μF,50V |
| | C11 | QEK61HM-105 | E CAPACITOR | 1μF,50V |
| | C12 | QETC1CM-106 | E CAPACITOR | 10μF,16V |
| | C13 | QEP61CM-106 | NP E CAPACITOR | 10μF,16V |
| | | or QEN61CM-106 | NP E CAPACITOR | 10μF,16V |
| | C14 | QETC1CM-336 | E CAPACITOR | 33μF,16V |
| | C15 | QETC1HM-104 | E CAPACITOR | 0.1μF,50V |
| | C16 | QETC1HM-105 | E CAPACITOR | 1μF,50V |
| | C17 | QFV71HJ-103 | TF CAPACITOR | 0.01μF,50V |
| | C19 | QETC1HM-335 | E CAPACITOR | 3.3μF,50V |
| | C20 | QCC11EJ-822 | CAPACITOR | 0.0082μF,25V |
| | C21 | QCC11EJ-152 | CAPACITOR | 0.0015μF,25V |
| | C24 | QCC11EJ-222 | CAPACITOR | 0.0022μF,25V |
| | C25 | PU57601-475MC | E CAPACITOR | 4.7μF |
| | C26 | QCBB1HJ-331 | CAPACITOR | 330PF,50V |
| | C27 | QFV71HJ-473 | TF CAPACITOR | 0.047μF,50V |
| | L1 | PU58308-103J | COIL | 10mH |
| | L5 | PU48530-471K | COIL | 470μH |

| # ⚠ | REF No. | PART No. | PART NAME, DESCRIPTION | |
|---|---|---|---|---|
| ⚠ | T1 | PU60510-2 | OSC TRANSFORMER | |
| | CN1 | PU58844-4 | CAP HOUSING | |

## – VIDEO SECTION –

| # ⚠ | REF No. | PART No. | PART NAME, DESCRIPTION | |
|---|---|---|---|---|
| | Q201 | DTC114WS | TRANSISTOR | |
| | Q202 | DTC144WS | TRANSISTOR | |
| | Q203 | 2SA933S(RS) | TRANSISTOR | |
| | | or 2SA1267(YG)-TJK | TRANSISTOR | |
| | Q204 | 2SC1740S(RS) | TRANSISTOR | |
| | | or 2SC3199(GB)-TJK | TRANSISTOR | |
| | Q205 | 2SC1740S(RS) | TRANSISTOR | |
| | | or 2SC3199(GB)-TJK | TRANSISTOR | |
| | Q206 | 2SC1740S(RS) | TRANSISTOR | |
| | | or 2SC3199(GB)-TJK | TRANSISTOR | |
| | Q207 | 2SA933S(RS) | TRANSISTOR | |
| | | or 2SA1267(YG)-TJK | TRANSISTOR | |
| | Q208 | 2SA933S(RS) | TRANSISTOR | |
| | | or 2SA1267(YG)-TJK | TRANSISTOR | |
| | Q209 | DTA114ES | TRANSISTOR | |
| | Q210 | 2SA854S(QR) | TRANSISTOR | |
| | D201 | 1SS133 | DIODE | |
| | | or MA165 | DIODE | |
| | D202 | 1SS133 | DIODE | |
| | | or MA165 | DIODE | |
| | D204 | 1SS133 | DIODE | |
| | | or MA165 | DIODE | |
| | D205 | 1SS133 | DIODE | |
| | | or MA165 | DIODE | |
| | D206 | 1SS133 | DIODE | |
| | | or MA165 | DIODE | |
| | D207 | 1SS133 | DIODE | |
| | | or MA165 | DIODE | |
| | D208 | 1SS133 | DIODE | |
| | | or MA165 | DIODE | |
| | D209 | 1SS133 | DIODE | |
| | | or MA165 | DIODE | |
| | D210 | 1SS133 | DIODE | |
| | | or MA165 | DIODE | |
| | D211 | 1SS133 | DIODE | |
| | | or MA165 | DIODE | |
| | R201 | QRD161J-472 | RESISTOR | 4.7KΩ,1/6W |
| | R202 | QRD161J-563 | RESISTOR | 56KΩ,1/6W |
| | R204 | QRD161J-182 | RESISTOR | 1.8KΩ,1/6W |
| | R205 | QRD161J-472 | RESISTOR | 4.7KΩ,1/6W |
| | R206 | QRD161J-562 | RESISTOR | 5.6KΩ,1/6W |
| | R207 | QRD161J-222 | RESISTOR | 2.2KΩ,1/6W |
| | R208 | QRD161J-182 | RESISTOR | 1.8KΩ,1/6W |
| | R209 | QRD161J-222 | RESISTOR | 2.2KΩ,1/6W |
| | R210 | QRD161J-222 | RESISTOR | 2.2KΩ,1/6W |
| | R211 | QRD161J-182 | RESISTOR | 1.8KΩ,1/6W |
| | R212 | QRD161J-152 | RESISTOR | 1.5KΩ,1/6W |
| | R213 | QRD161J-152 | RESISTOR | 1.5KΩ,1/6W |
| | R214 | QRD161J-331 | RESISTOR | 330Ω,1/6W |

| #⚠ REF No. | PART No. | PART NAME, DESCRIPTION | |
|---|---|---|---|
| R215 | QRD161J-681 | RESISTOR | 680Ω,1/6W |
| R216 | QRD161J-331 | RESISTOR | 330Ω,1/6W |
| R217 | QRD161J-222 | RESISTOR | 2.2KΩ,1/6W |
| R218 | QRD161J-153 | RESISTOR | 15KΩ,1/6W |
| R219 | QRD161J-103 | RESISTOR | 10KΩ,1/6W |
| R220 | QVZ3518-681AZ | V RESISTOR,REC COLOR(SP) | 680Ω |
| | or QVZ3523-681AZ | V RESISTOR | 680Ω |
| R221 | QRD161J-222 | RESISTOR | 2.2KΩ,1/6W |
| R222 | QRD161J-333 | RESISTOR | 33KΩ,1/6W |
| R223 | QRD161J-153 | RESISTOR | 15KΩ,1/6W |
| R224 | QRD161J-152 | RESISTOR | 1.5KΩ,1/6W |
| R225 | QRD161J-561 | RESISTOR | 560Ω,1/6W |
| R226 | QVZ3518-332AZ | V RESISTOR,SP FREQ | 3.3KΩ |
| | or QVZ3523-332AZ | V RESISTOR | 3.3KΩ |
| R227 | QRD161J-101 | RESISTOR | 100Ω,1/6W |
| R228 | QRD161J-102 | RESISTOR | 1KΩ,1/6W |
| R229 | QRD161J-123 | RESISTOR | 12KΩ,1/6W |
| R230 | QRD162J-103 | RESISTOR | 10KΩ,1/6W |
| R231 | QRD123J-391SX | RESISTOR | 390Ω,1/2W |
| R232 | QRD161J-472 | RESISTOR | 4.7KΩ,1/6W |
| R233 | QRD161J-682 | RESISTOR | 6.8KΩ,1/6W |
| R234 | QRD161J-101 | RESISTOR | 100Ω,1/6W |
| R235 | QRD161J-102 | RESISTOR | 1KΩ,1/6W |
| R236 | QRD161J-102 | RESISTOR | 1KΩ,1/6W |
| R237 | QRD161J-222 | RESISTOR | 2.2KΩ,1/6W |
| R238 | QRD161J-750 | RESISTOR | 75Ω,1/6W |
| R239 | QRD161J-750 | RESISTOR | 75Ω,1/6W |
| R240 | QRD161J-102 | RESISTOR | 1KΩ,1/6W |
| R243 | QRD161J-103 | RESISTOR | 10KΩ,1/6W |
| R244 | QRD161J-682 | RESISTOR | 6.8KΩ,1/6W |
| R250 | QRD161J-471 | RESISTOR | 470Ω,1/6W |
| C201 | QEN61AM-226 | NP E CAPACITOR | 22μF,10V |
| | or QENC1AM-226 | NP E CAPACITOR | 22μF,10V |
| C202 | QCVB1CN-103 | CAPACITOR | 0.01μF,16V |
| C203 | QCVB1CN-103 | CAPACITOR | 0.01μF,16V |
| C204 | QCVB1CN-103 | CAPACITOR | 0.01μF,16V |
| C205 | QCBB1HJ-121 | CAPACITOR | 120PF,50V |
| C206 | QCBB1HJ-121 | CAPACITOR | 120PF,50V |
| C207 | QCVB1CN-103 | CAPACITOR | 0.01μF,16V |
| C208 | QCVB1CN-103 | CAPACITOR | 0.01μF,16V |
| C209 | QETC1CM-476 | E CAPACITOR | 47μF,16V |
| C210 | QCVB1CN-103 | CAPACITOR | 0.01μF,16V |
| C211 | QCVB1CN-103 | CAPACITOR | 0.01μF,16V |
| C212 | QETC0JM-476 | E CAPACITOR | 47μF,6.3V |
| C213 | QCVB1CN-103 | CAPACITOR | 0.01μF,16V |
| C214 | QCVB1CN-103 | CAPACITOR | 0.01μF,16V |
| C215 | QCSB1HJ-330 | CAPACITOR | 33PF,50V |
| C216 | QETC1CM-476 | E CAPACITOR | 47μF,16V |
| C217 | QCVB1CN-103 | CAPACITOR | 0.01μF,16V |
| C218 | QETC0JM-477 | E CAPACITOR | 470μF,6.3V |
| C219 | QETC0JM-476 | E CAPACITOR | 47μF,6.3V |
| C220 | QCC31CJ-473 | CAPACITOR | 0.047μF,16V |
| C221 | QETC1HM-474 | E CAPACITOR | 0.47μF,50V |
| C222 | QETC1HM-105 | E CAPACITOR | 1μF,50V |
| C224 | QCBB1HJ-102 | CAPACITOR | 0.001μF,50V |

| #⚠ REF No. | PART No. | PART NAME, DESCRIPTION | |
|---|---|---|---|
| C225 | QCFB1EZ-223 | CAPACITOR | 0.022μF,25V |
| C240 | QCC31CJ-333 | CAPACITOR | 0.033μF,16V |
| C241 | QETC1CM-336 | E CAPACITOR | 33μF,16V |
| L201 | PU59152-221J | COIL | 220μH |
| L202 | PU59152-560J | COIL | 56μH |
| L203 | PU48530-101K | COIL | 100μH |
| L204 | PU48530-101K | COIL | 100μH |
| L205 | PU59152-220J | COIL | 22μH |
| L206 | PU48530-101K | COIL | 100μH |
| L207 | PU54710-222 | COIL | 2.2mH |
| L208 | PU59152-R22J | COIL | 0.22μH |
| CN204 | PU58844-6 | CAP HOUSING | |
| CN205 | PU59555-4 | CAP HOUSING | |

### – SERVO SECTION –

| #⚠ REF No. | PART No. | PART NAME, DESCRIPTION | |
|---|---|---|---|
| IC401 | HD49733NT | IC | |
| | or HD49733ANT | IC | |
| IC501 | BA7039 | IC | |
| | or XRA7039 | IC | |
| Q402 | 2SA1309(QRS) | TRANSISTOR | |
| | or 2SA1267(YG)-TJK | TRANSISTOR | |
| | or 2SA933S(QRS) | TRANSISTOR | |
| D401 | 1SS133 | DIODE | |
| | or MA165 | DIODE | |
| D402 | 1SS133 | DIODE | |
| | or MA165 | DIODE | |
| D403 | 1SS133 | DIODE | |
| | or MA165 | DIODE | |
| D404 | 1SS133 | DIODE | |
| | or MA165 | DIODE | |
| D407 | 1SS133 | DIODE | |
| | or MA165 | DIODE | |
| D408 | 1SS133 | DIODE | |
| | or MA165 | DIODE | |
| D409 | 1SS133 | DIODE | |
| | or MA165 | DIODE | |
| D410 | 1SS133 | DIODE | |
| | or MA165 | DIODE | |
| R401 | QRD161J-223 | RESISTOR | 22KΩ,1/6W |
| R402 | QRD161J-225 | RESISTOR | 2.2MΩ,1/6W |
| R403 | QRD161J-683 | RESISTOR | 68KΩ,1/6W |
| R404 | QRD161J-222 | RESISTOR | 2.2KΩ,1/6W |
| R405 | QRD161J-123 | RESISTOR | 12KΩ,1/6W |
| R406 | QRD161J-472 | RESISTOR | 4.7KΩ,1/6W |
| R407 | QRD161J-392 | RESISTOR | 3.9KΩ,1/6W |
| R408 | QRD161J-105 | RESISTOR | 1MΩ,1/6W |
| R409 | QRD161J-273 | RESISTOR | 27KΩ,1/6W |

| #⚠ REF No. | PART No. | PART NAME, DESCRIPTION | |
|---|---|---|---|
| R411 | QRD161J-105 | RESISTOR | 1MΩ,1/6W |
| R412 | QRD161J-273 | RESISTOR | 27KΩ,1/6W |
| R413 | QRD161J-273 | RESISTOR | 27KΩ,1/6W |
| R414 | QRD161J-335 | RESISTOR | 3.3MΩ,1/6W |
| R415 | QRD161J-334 | RESISTOR | 330KΩ,1/6W |
| R416 | QRD161J-822 | RESISTOR | 8.2KΩ,1/6W |
| R418 | QRD161J-102 | RESISTOR | 1KΩ,1/6W |
| R419 | QRD161J-473 | RESISTOR | 47KΩ,1/6W |
| R420 | QVZ3518-684 | V RESISTOR,SP SW POINT | 680KΩ |
| R422 | QRD161J-104 | RESISTOR | 100KΩ,1/6W |
| R426 | QRD161J-821 | RESISTOR | 820Ω,1/6W |
| R427 | QRD161J-102 | RESISTOR | 1KΩ,1/6W |
| R428 | QRD161J-105 | RESISTOR | 1MΩ,1/6W |
| R429 | QRD161J-102 | RESISTOR | 1KΩ,1/6W |
| R430 | QRD161J-102 | RESISTOR | 1KΩ,1/6W |
| R434 | QRD161J-102 | RESISTOR | 1KΩ,1/6W |
| R435 | QRD161J-102 | RESISTOR | 1KΩ,1/6W |
| R436 | QRD161J-274 | RESISTOR | 270KΩ,1/6W |
| R437 | QRD161J-274 | RESISTOR | 270KΩ,1/6W |
| R438 | QRD161J-224 | RESISTOR | 220KΩ,1/6W |
| R439 | QRD161J-103 | RESISTOR | 10KΩ,1/6W |
| R440 | QRD161J-474 | RESISTOR | 470KΩ,1/6W |
| R441 | QRD161J-823 | RESISTOR | 82KΩ,1/6W |
| R501 | QRD161J-102 | RESISTOR | 1KΩ,1/6W |
| R502 | QRD161J-332 | RESISTOR | 3.3KΩ,1/6W |
| R503 | QRD161J-272 | RESISTOR | 2.7KΩ,1/6W |
| R508 | QRD161J-124 | RESISTOR | 120KΩ,1/6W |
| C401 | QCVB1CM-103 | CAPACITOR | 0.01µF,16V |
| C402 | QEK61AM-226 | E CAPACITOR | 22µF,10V |
| C403 | QFV11HJ-224 | TF CAPACITOR | 0.22µF,50V |
| C404 | QCC31CK-682 | CAPACITOR | 0.0068µF,16V |
| C405 | QEK61EM-475 | E CAPACITOR | 4.7µF,25V |
| C406 | QEK61EM-475 | E CAPACITOR | 4.7µF,25V |
| C407 | QEK61CM-106 | E CAPACITOR | 10µF,16V |
| C408 | QEK61CM-106 | E CAPACITOR | 10µF,16V |
| C409 | QCC31CK-223 | CAPACITOR | 0.022µF,16V |
| C410 | QFV71HJ-184 | TF CAPACITOR | 0.18µF,50V |
| | or QFV11HJ-184 | MMT CAPACITOR | 0.18µF,50V |
| C411 | QCBB1HJ-471 | CAPACITOR | 470PF,50V |
| C412 | QFL31HJ-682 | M CAPACITOR | 0.0068µF,50V |
| | or QFN31HJ-682 | M CAPACITOR | 0.0068µF,50V |
| C414 | QCBB1HJ-102 | CAPACITOR | 0.001µF,50V |
| C415 | QEK61AM-226 | E CAPACITOR | 22µF,10V |
| C416 | QEK61AM-226 | E CAPACITOR | 22µF,10V |
| C417 | QCBB1HJ-271 | CAPACITOR | 270PF,50V |
| C418 | QCBB1HJ-561 | CAPACITOR | 560PF,50V |
| C419 | QCBB1HJ-102 | CAPACITOR | 0.001µF,50V |
| C420 | QEK61HM-105 | E CAPACITOR | 1µF,50V |
| C421 | QCBB1HJ-102 | CAPACITOR | 0.001µF,50V |
| C422 | QFV71HJ-563 | TF CAPACITOR | 0.056µF,50V |
| | or QFV11HJ-563 | MMT CAPACITOR | 0.056µF,50V |
| C423 | QCBB1HJ-102 | CAPACITOR | 0.001µF,50V |
| C427 | QCBB1HJ-181 | CAPACITOR | 180PF,50V |

| #⚠ REF No. | PART No. | PART NAME, DESCRIPTION | |
|---|---|---|---|
| C502 | QCVB1CM-103 | CAPACITOR | 0.01µF,16V |
| C504 | QFV71HJ-104 | TF CAPACITOR | 0.1µF,50V |
| | or QFV11HJ-104 | MM CAPACITOR | 0.1µF,50V |
| C505 | QCVB1CM-103 | CAPACITOR | 0.01µF,16V |
| C506 | QFV71HJ-683 | TF CAPACITOR | 0.068µF,50V |
| | or QFV11HJ-683 | MMT CAPACITOR | 0.068µF,50V |
| C507 | QCVB1CM-103 | CAPACITOR | 0.01µF,16V |
| C508 | QEK61AM-226 | E CAPACITOR | 22µF,10V |
| C509 | QCVB1CM-103 | CAPACITOR | 0.01µF,16V |
| L501 | PU59152-270J | COIL | 27µH |
| CN401 | PU59555-4 | CAP HOUSING | |
| CN402 | PU58844-3 | CAP HOUSING | |
| ⚠ CP401 | ICP-F15 | CIRCUIT PROTECTOR | |

## – MECHACON SECTION –

| | | | |
|---|---|---|---|
| IC601 | M37418M6-364SP | IC | |
| IC603 | M50253P | IC | |
| Q602 | DTC114ES | TRANSISTOR | |
| Q603 | 2SB1425(EU) | TRANSISTOR | |
| D601 | HZS7.5EB2 | ZENER DIODE | |
| | or MTZ7.5B | ZENER DIODE | |
| | or UZ7.5BSB | ZENER DIODE | |
| D602 | MA165 | DIODE | |
| | or 1SS133 | DIODE | |
| D603 | MA165 | DIODE | |
| | or 1SS133 | DIODE | |
| D604 | MA165 | DIODE | |
| | or 1SS133 | DIODE | |
| D605 | MA165 | DIODE | |
| | or 1SS133 | DIODE | |
| D606 | 11ES2 | DIODE | |
| | or 1SR139-200 | DIODE | |
| | or S5688G | DIODE | |
| | or ERA15-02 | DIODE | |
| R601 | QRD161J-332 | RESISTOR | 3.3KΩ,1/6W |
| R602 | QRD161J-332 | RESISTOR | 3.3KΩ,1/6W |
| R603 | QRD161J-103 | RESISTOR | 10KΩ,1/6W |
| R604 | QRD161J-472 | RESISTOR | 4.7KΩ,1/6W |
| R605 | QRD161J-102 | RESISTOR | 1KΩ,1/6W |
| R606 | QRD161J-472 | RESISTOR | 4.7KΩ,1/6W |
| R607 | QRD161J-472 | RESISTOR | 4.7KΩ,1/6W |
| R608 | QRD161J-472 | RESISTOR | 4.7KΩ,1/6W |
| R609 | QRD161J-102 | RESISTOR | 1KΩ,1/6W |
| R610 | QRD161J-102 | RESISTOR | 1KΩ,1/6W |
| R611 | QRD161J-102 | RESISTOR | 1KΩ,1/6W |
| R612 | QRD161J-472 | RESISTOR | 4.7KΩ,1/6W |
| R613 | QRD161J-102 | RESISTOR | 1KΩ,1/6W |
| R614 | QRD161J-103 | RESISTOR | 10KΩ,1/6W |

| #⚠ REF No. | PART No. | PART NAME, DESCRIPTION | |
|---|---|---|---|
| R615 | QRD161J-472 | RESISTOR | 4.7KΩ,1/6W |
| R616 | QRD161J-103 | RESISTOR | 10KΩ,1/6W |
| R617 | QRD161J-472 | RESISTOR | 4.7KΩ,1/6W |
| R618 | QRD161J-472 | RESISTOR | 4.7KΩ,1/6W |
| R619 | QRD161J-472 | RESISTOR | 4.7KΩ,1/6W |
| R620 | QRD161J-472 | RESISTOR | 4.7KΩ,1/6W |
| R621 | QRD161J-472 | RESISTOR | 4.7KΩ,1/6W |
| R622 | QRD161J-102 | RESISTOR | 1KΩ,1/6W |
| R623 | QRD161J-102 | RESISTOR | 1KΩ,1/6W |
| R624 | QRD162J-105 | RESISTOR | 1MΩ,1/6W |
| R625 | QRD162J-472 | RESISTOR | 4.7KΩ,1/6W |
| R626 | QRD161J-103 | RESISTOR | 10KΩ,1/6W |
| R627 | QRD161J-103 | RESISTOR | 10KΩ,1/6W |
| R628 | QRD161J-822 | RESISTOR | 8.2KΩ,1/6W |
| R629 | QRD161J-471 | RESISTOR | 470Ω,1/6W |
| R630 | QRD161J-333 | RESISTOR | 33KΩ,1/6W |
| R631 | QRD161J-563 | RESISTOR | 56KΩ,1/6W |
| R632 | QRD161J-103 | RESISTOR | 10KΩ,1/6W |
| R633 | QRD161J-303 | RESISTOR | 30KΩ,1/6W |
| R634 | QRD161J-154 | RESISTOR | 150KΩ,1/6W |
| R635 | QRD161J-333 | RESISTOR | 33KΩ,1/6W |
| R636 | QRD161J-103 | RESISTOR | 10KΩ,1/6W |
| R637 | QRD161J-224 | RESISTOR | 220KΩ,1/6W |
| R638 | QRD161J-103 | RESISTOR | 10KΩ,1/6W |
| R639 | QRD161J-472 | RESISTOR | 4.7KΩ,1/6W |
| R641 | QRD161J-471 | RESISTOR | 470Ω,1/6W |
| R642 | QRD161J-472 | RESISTOR | 4.7KΩ,1/6W |
| R643 | QRD161J-222 | RESISTOR | 2.2KΩ,1/6W |
| RA601 | QRB035J-103XC | RESISTOR ARRAY | |
| C601 | QEK61HM-105 | E CAPACITOR | 1μF,50V |
| C602 | QCFB1EZ-223 | CAPACITOR | 0.022μF,25V |
| C603 | QEK61EM-335 | E CAPACITOR | 3.3μF,25V |
| C604 | QCC11EK-104 | CAPACITOR | 0.1μF,25V |
| C605 | QEK60JM-107 | E CAPACITOR | 100μF,6.3V |
| C606 | QCBB1HJ-121 | CAPACITOR | 120PF,50V |
| C607 | QCBB1HJ-471 | CAPACITOR | 470PF,50V |
| C608 | QETB1CM-337 | E CAPACITOR | 330μF,16V |
| C609 | QCSB1HJ-220 | CAPACITOR | 22PF,50V |
| L601 | PU59152-2R2J | COIL | 2.2μH |
| ⚠ CF601 | PU60440 | RESONATOR | |
| ⚠ | or PU60440-2 | RESONATOR | |
| WR1 | PW30602-17740 | PARALLEL WIRE(CN601) | |
| CN601 | PEMC0722-017 | WIRE TRAP | |
| | or PEMC0753-017 | WIRE TRAP(PARALLEL WIRE) | |
| CN602 | PU59555-4 | CAP HOUSING | |
| CN603 | PU59555-10 | CAP HOUSING | |
| CN604 | PU58844-9 | CAP HOUSING | |

| #⚠ REF No. | PART No. | PART NAME, DESCRIPTION | |
|---|---|---|---|
| CN605 | PU58844-3 | CAP HOUSING | |
| ⚠ CP601 | ICP-F25 | CIRCUIT PROTECTOR | |

### – REGULATOR BOARD ASSEMBLY –

| #⚠ REF No. | PART No. | PART NAME, DESCRIPTION | |
|---|---|---|---|
| Q851 | 2SB810H,J | TRANSISTOR | |
| D851 | 1SS133 | DIODE | |
| D852 | 1SS133 | DIODE | |
| D853 | 1SS133 | DIODE | |
| R851 | QRD161J-393 | RESISTOR | 39KΩ,1/6W |
| R852 | QRD161J-102 | RESISTOR | 1KΩ,1/6W |
| L851 | PU59152-100J | COIL | 10μH |
| L853 | PU59152-101J | COIL | 100μH |
| ⚠ TH801 | PU52108-1R0 | POSITIVE THERMISTOR | |
| CN801 | PU61044-12 | CAP HOUSING | |

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## VIDEO UNIT BOARD ASSEMBLY <05>

| #⚠ REF No. | PART No. | PART NAME, DESCRIPTION |
|---|---|---|
| PWBA | PB10256A-04 | VIDEO UNIT BOARD ASSEMBLY |
| IC1 | PB20166G-01 | Y MODULE BOARD ASSY |
| ⚠ IC2 | MSM6967RS | IC |
| IC201 | PB20227A | COLOR MODULE BOARD |
| IC251 | BA7106LS | IC |
| | or XRA7106LS | IC |
| Q1 | DTA144EU | TRANSISTOR |
| Q2 | 2SC2412K | TRANSISTOR |
| Q3 | DTC144EK | TRANSISTOR |
| Q4 | 2SA1037K | TRANSISTOR |
| Q5 | 2SC2412K | TRANSISTOR |
| Q201 | 2SC2412K | TRANSISTOR |
| Q202 | 2SC2412K | TRANSISTOR |
| Q203 | DTC114WK | TRANSISTOR |
| Q204 | 2SC2412K | TRANSISTOR |
| Q205 | 2SA1037K | TRANSISTOR |

| #⚠ | REF No. | PART No. | PART NAME, DESCRIPTION | |
|---|---|---|---|---|
| | Q251 | DTC114WK | TRANSISTOR | |
| | D1 | 1SS133 | DIODE | |
| | | or MA165 | DIODE | |
| | D2 | 1SS133 | DIODE | |
| | | or MA165 | DIODE | |
| | D3 | 1SS133 | DIODE | |
| | | or MA165 | DIODE | |
| | D4 | 1SS133 | DIODE | |
| | | or MA165 | DIODE | |
| | D5 | 1SS292 | DIODE | |
| | D6 | 1SS133 | DIODE | |
| | | or MA165 | DIODE | |
| | D7 | 1SS133 | DIODE | |
| | | or MA165 | DIODE | |
| | D9 | RD9.1ES-T1B2 | ZENER DIODE | |
| | | or UZ9.1BSB | ZENER DIODE | |
| | D10 | 1SS133 | DIODE | |
| | | or MA165 | DIODE | |
| | D201 | 1SS133 | DIODE | |
| | | or MA165 | DIODE | |
| | D202 | 1SS133 | DIODE | |
| | | or MA165 | DIODE | |
| | D203 | 1SS133 | DIODE | |
| | | or MA165 | DIODE | |
| | D251 | 1SS133 | DIODE | |
| | | or MA165 | DIODE | |
| | D252 | 1SS133 | DIODE | |
| | | or MA165 | DIODE | |
| | D253 | 1SS133 | DIODE | |
| | | or MA165 | DIODE | |
| | R1 | QRSA08J-103YN | RESISTOR | 10KΩ,1/10W |
| | R2 | QRSA08J-102YN | RESISTOR | 1KΩ,1/10W |
| | R3 | QRSA08J-681YN | RESISTOR | 680Ω,1/10W |
| | R5 | QRSA08J-562YN | RESISTOR | 5.6KΩ,1/10W |
| | R6 | QRSA08J-103YN | RESISTOR | 10KΩ,1/10W |
| | R7 | QRSA08J-104YN | RESISTOR | 100KΩ,1/10W |
| | R8 | QRSA08J-273YN | RESISTOR | 27KΩ,1/10W |
| | R9 | QRSA08J-394YN | RESISTOR | 390KΩ,1/10W |
| | R10 | QRSA08J-103YN | RESISTOR | 10KΩ,1/10W |
| | R11 | QRSA08J-221YN | RESISTOR | 220Ω,1/10W |
| | R12 | QRSA08J-222YN | RESISTOR | 2.2KΩ,1/10W |
| | R13 | QRSA08J-221YN | RESISTOR | 220Ω,1/10W |
| | R14 | QRSA08J-222YN | RESISTOR | 2.2KΩ,1/10W |
| | R15 | QRSA08J-102YN | RESISTOR | 1KΩ,1/10W |
| | R16 | QVZ3518-222AZ | V RESISTOR,NC BALANCE | 2.2KΩ |
| | | or QVZ3523-222AZ | V RESISTOR | 2.2KΩ |
| | R17 | QRSA08J-222YN | RESISTOR | 2.2KΩ,1/10W |
| | R18 | QRSA08J-102YN | RESISTOR | 1KΩ,1/10W |
| ⚠ | R20 | QRD161J-181 | RESISTOR | 180Ω,1/6W |
| | R201 | QRSA08J-183YN | RESISTOR | 18KΩ,1/10W |
| | R202 | QRSA08J-332YN | RESISTOR | 3.3KΩ,1/10W |
| | R203 | QRD161J-222 | RESISTOR | 2.2KΩ,1/6W |
| | R204 | QRSA08J-333YN | RESISTOR | 33KΩ,1/10W |
| | R205 | QRD161J-223 | RESISTOR | 22KΩ,1/6W |

| #⚠ | REF No. | PART No. | PART NAME, DESCRIPTION | |
|---|---|---|---|---|
| | R206 | QRSA08J-102YN | RESISTOR | 1KΩ,1/10W |
| | R207 | QRSA08J-102YN | RESISTOR | 1KΩ,1/10W |
| | R208 | QRSA08J-682YN | RESISTOR | 6.8KΩ,1/10W |
| | R209 | QRSA08J-391YN | RESISTOR | 390Ω,1/10W |
| | R210 | QRSA08J-333YN | RESISTOR | 33KΩ,1/10W |
| | R211 | QRSA08J-333YN | RESISTOR | 33KΩ,1/10W |
| | R212 | QRSA08J-152YN | RESISTOR | 1.5KΩ,1/10W |
| | R213 | QRSA08J-331YN | RESISTOR | 330Ω,1/10W |
| | R214 | QRSA08J-222YN | RESISTOR | 2.2KΩ,1/10W |
| | R215 | QRSA08J-332YN | RESISTOR | 3.3KΩ,1/10W |
| | R216 | QRSA08J-102YN | RESISTOR | 1KΩ,1/10W |
| | R217 | QRSA08J-393YN | RESISTOR | 39KΩ,1/10W |
| | R218 | QRSA08J-332YN | RESISTOR | 3.3KΩ,1/10W |
| | R219 | QRSA08J-102YN | RESISTOR | 1KΩ,1/10W |
| | R220 | QRSA08J-102YN | RESISTOR | 1KΩ,1/10W |
| | R221 | QRSA08J-102YN | RESISTOR | 1KΩ,1/10W |
| | R222 | QRSA08J-391YN | RESISTOR | 390Ω,1/10W |
| | R223 | QRSA08J-821YN | RESISTOR | 820Ω,1/10W |
| | R224 | QRSA08J-471YN | RESISTOR | 470Ω,1/10W |
| | R251 | QRSA08J-682YN | RESISTOR | 6.8KΩ,1/10W |
| | R252 | QRSA08J-333YN | RESISTOR | 33KΩ,1/10W |
| | R253 | QRD161J-273 | RESISTOR | 27KΩ,1/6W |
| | R254 | QRSA08J-914YN | RESISTOR | 910KΩ,1/10W |
| | R255 | QRSA08J-103YN | RESISTOR | 10KΩ,1/10W |
| | R256 | QRSA08J-104YN | RESISTOR | 100KΩ,1/10W |
| | C1 | QCSA1HJ-220 | CAPACITOR | 22PF,50V |
| | C2 | QCFA1HZ-103 | CAPACITOR | 0.01μF,50V |
| | C3 | QCSA1HJ-151 | CAPACITOR | 150PF,50V |
| | C4 | QETC1AM-226 | E CAPACITOR | 22μF,10V |
| | C5 | QCYA1HK-102 | CAPACITOR | 0.001μF,50V |
| | C6 | QCFA1HZ-103 | CAPACITOR | 0.01μF,50V |
| | C7 | QETC1EM-335 | E CAPACITOR | 3.3μF,25V |
| | C8 | QEN60JM-336 | NP E CAPACITOR | 33μF,6.3V |
| | C9 | QETC1CM-106 | E CAPACITOR | 10μF,16V |
| | C10 | QCYA1HK-102 | CAPACITOR | 0.001μF,50V |
| | C11 | QCYA1HK-102 | CAPACITOR | 0.001μF,50V |
| | C12 | QEN61HM-224 | NP E CAPACITOR | 0.22μF,50V |
| | | or QENC1HM-224 | NP E CAPACITOR | 0.22μF,50V |
| | C13 | QCSA1HJ-120 | CAPACITOR | 12PF,50V |
| | C14 | QETC1EM-335 | E CAPACITOR | 3.3μF,25V |
| | C15 | QCVC1CN-103 | CAPACITOR | 0.01μF,16V |
| | C16 | QEN61HM-335 | NP E CAPACITOR | 3.3μF,50V |
| | C17 | QETC0JM-337 | E CAPACITOR | 330μF,6.3V |
| | C18 | QCFA1HZ-103 | CAPACITOR | 0.01μF,50V |
| | C19 | QEN61HM-225 | NP E CAPACITOR | 2.2μF,50V |
| | C20 | QCSA1HJ-120 | CAPACITOR | 12PF,50V |
| | C21 | QETC1EM-475 | E CAPACITOR | 4.7μF,25V |
| | C22 | QETC1EM-475 | E CAPACITOR | 4.7μF,25V |
| | C23 | QETC0JM-476 | E CAPACITOR | 47μF,6.3V |
| | C24 | QETC1HM-104 | E CAPACITOR | 0.1μF,50V |
| | C25 | QCFA1HZ-103 | CAPACITOR | 0.01μF,50V |
| | C26 | QCFA1HZ-103 | CAPACITOR | 0.01μF,50V |
| | C27 | QCFA1HZ-103 | CAPACITOR | 0.01μF,50V |
| | C28 | QCFA1HZ-103 | CAPACITOR | 0.01μF,50V |
| | C29 | QETC1AM-476 | E CAPACITOR | 47μF,10V |

| #⚠ REF No. | PART No. | PART NAME, DESCRIPTION | |
|---|---|---|---|
| C201 | QCSA1HJ-470 | CAPACITOR | 47PF,50V |
| C202 | QCVB1CN-103 | CAPACITOR | 0.01μF,16V |
| C203 | QCSA1HJ-820 | CAPACITOR | 82PF,50V |
| C204 | QETC1HM-475 | E CAPACITOR | 4.7μF,50V |
| C205 | QCVB1CN-103 | CAPACITOR | 0.01μF,16V |
| C206 | QFN31HJ-224 | M CAPACITOR | 0.22μF,50V |
| C207 | QFN31HJ-563 | M CAPACITOR | 0.056μF,50V |
| C208 | QETC0JM-337 | E CAPACITOR | 330μF,6.3V |
| C209 | QCC31CJ-223 | CAPACITOR | 0.022μF,16V |
| C210 | QER60JM-107 | E CAPACITOR | 100μF,6.3V |
| C211 | QER61CM-106 | E CAPACITOR | 10μF,16V |
| C212 | QETC1HM-224 | E CAPACITOR | 0.22μF,50V |
| C213 | QCFA1HZ-103 | CAPACITOR | 0.01μF,50V |
| C214 | QCVB1CN-103 | CAPACITOR | 0.01μF,16V |
| C215 | QETC1HM-474 | E CAPACITOR | 0.47μF,50V |
| C218 | QCFA1HZ-103 | CAPACITOR | 0.01μF,50V |
| C219 | QCC11CJ-473 | CAPACITOR | 0.047μF,16V |
| C220 | QCBB1HJ-121 | CAPACITOR | 120PF,50V |
| C221 | QCBB1HJ-102 | CAPACITOR | 0.001μF,50V |
| C222 | QCSB1HJ-150 | CAPACITOR | 15PF,50V |
| C223 | QCBB1HJ-102 | CAPACITOR | 0.001μF,50V |
| C251 | QETC1CM-106 | E CAPACITOR | 10μF,16V |
| C252 | QFN31HJ-471 | M CAPACITOR | 470PF,50V |
| C253 | QCSA1HJ-270 | CAPACITOR | 27PF,50V |
| C254 | QETC1HM-335 | E CAPACITOR | 3.3μF,50V |
| C255 | QCYA1HK-472 | CAPACITOR | 0.0047μF,50V |
| C256 | QCYA1HK-471 | CAPACITOR | 470PF,50V |
| C257 | QCSA1HJ-5R0 | CAPACITOR | 5PF,50V |
| C258 | QCFA1HZ-103 | CAPACITOR | 0.01μF,50V |
| C259 | QCFA1HZ-103 | CAPACITOR | 0.01μF,50V |
| C260 | QCFA1HZ-103 | CAPACITOR | 0.01μF,50V |
| C261 | QCSA1HJ-220 | CAPACITOR | 22PF,50V |
| C262 | QCFA1HZ-103 | CAPACITOR | 0.01μF,50V |
| C263 | QETB0JM-477 | E CAPACITOR | 470μF,6.3V |
| C264 | QCFA1HZ-103 | CAPACITOR | 0.01μF,50V |
| C265 | QCFA1HZ-103 | CAPACITOR | 0.01μF,50V |
| L1 | PU59152-121J | COIL | 120μH |
| L2 | PU59152-680J | COIL | 68μH |
| L3 | PU48530-101K | COIL | 100μH |
| L4 | PU59152-R22J | COIL | 0.22μH |
| L5 | PU59152-101J | COIL | 100μH |
| L6 | PU59152-R22J | COIL | 0.22μH |
| L201 | PU48530-271J | COIL | 270μH |
| L202 | PU59153-822J | COIL | 8.2mH |
| ⚠ L203 | PU48530-151J | COIL | 150μH |
| L205 | PU59152-150J | COIL | 15μH |
| L251 | PU59152-330J | COIL,SECAM DET | 33μH |
| L252 | PU48530-101K | COIL | 100μH |
| EQ2 | PU60162-2 | EQUALIZER | |
| | or PU60162 | EQUALIZER | |

| #⚠ REF No. | PART No. | PART NAME, DESCRIPTION |
|---|---|---|
| EQ201 | PU53501-11 | EQUALIZER |
| | or PU53501-6 | EQUALIZER |
| LPF1 | PU58021-3 | LOW PASS FILTER |
| | or PU60715 | LOW PASS FILTER |
| | or PU58021-2 | LOW PASS FILTER |
| LPF2 | PU60716 | LOW PASS FILTER |
| LPF201 | PU58022 | LOW PASS FILTER |
| BPF201 | PU60654 | BAND PASS FILTER |
| | or PU60654-2 | BAND PASS FILTER |
| BPF202 | PU60713 | BAND PASS FILTER |
| CF201 | PU57073 | CERAMIC FILTER |
| DL201 | PU60340-2 | COMB FILTER |
| | or PU60490 | COMB FILTER |
| | or PU58971-3 | COMB FILTER(2H DELAY LINE) |
| LC251 | PU60655 | COIL,SECAM DET |
| ⚠ X201 | PU60653 | CRYSTAL UNITS |
| SLD1 | PQ42994 | SHIELD PLATE |
| SLD2 | PQ42995 | SHIELD CASE |
| SLD3 | PQ42996 | SHIELD COVER |
| TP21 | PU56347 | TEST POINT |
| CN1 | PU60330-113 | CONNECTOR |
| CN2 | PU60330-113 | CONNECTOR |
| CN3 | PU60330-110 | CONNECTOR,(TERMINAL) |

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## IF BOARD ASSEMBLY <07>

| | | |
|---|---|---|
| PWBA | PB10242F | IF BOARD ASSEMBLY |
| IC1 | M51365SP | IC |
| Q2 | 2SC3354 | TRANSISTOR |
| Q3 | 2SC1317(RS) | TRANSISTOR |

| #△ REF No. | PART No. | PART NAME, DESCRIPTION | |
|---|---|---|---|
| Q4 | 2SC1740(RS) | TRANSISTOR | |
| | or 2SC3199(G) | TRANSISTOR | |
| | or 2SC536SPA(FG) | TRANSISTOR | |
| | or 2SC3311A(RS) | TRANSISTOR | |
| Q5 | 2SC1740(RS) | TRANSISTOR | |
| | or 2SC3311A(RS) | TRANSISTOR | |
| | or 2SC3199(G) | TRANSISTOR | |
| | or 2SC536SPA(FG) | TRANSISTOR | |
| Q6 | 2SA933S(RS) | TRANSISTOR | |
| | or 2SA1267(G)-TJK | TRANSISTOR | |
| | or 2SA1309AR,S | TRANSISTOR | |
| Q7 | 2SC1740(RS) | TRANSISTOR | |
| | or 2SC3311A(RS) | TRANSISTOR | |
| | or 2SC536SPA(FG) | TRANSISTOR | |
| | or 2SC3199(G) | TRANSISTOR | |
| Q9 | 2SD1450S,T | TRANSISTOR | |
| | or 2SD1468S(RSE) | TRANSISTOR | |
| Q11 | 2SC1740(RS) | TRANSISTOR | |
| | or 2SC3199(G)JK | TRANSISTOR | |
| | or 2SC536SPA(FG) | TRANSISTOR | |
| | or 2SC3311A(RS) | TRANSISTOR | |
| Q14 | DTC144ES | TRANSISTOR | |
| | or 2SC3399 | TRANSISTOR | |
| | or UN4213 | TRANSISTOR | |
| D1 | MTZ10B | ZENER DIODE | |
| D5 | SVC321SPA-B-1 | V.DIODE | |
| D6 | 1SS133 | DIODE | |
| D7 | 1SS133 | DIODE | |
| D8 | 1SS133 | DIODE | |
| R1 | NRD718J-750NYU | RESISTOR | 75Ω,1/8W |
| R4 | NRD718J-392NYU | RESISTOR | 3.9KΩ,1/8W |
| R6 | NRD718J-182NYU | RESISTOR | 1.8KΩ,1/8W |
| R8 | NRD718J-681NYU | RESISTOR | 680Ω,1/8W |
| R10 | NRD718J-271NYU | RESISTOR | 270Ω,1/8W |
| R11 | NRD718J-820NYU | RESISTOR | 82Ω,1/8W |
| R15 | NRD718J-271NYU | RESISTOR | 270Ω,1/8W |
| R17 | NRD718J-562NYU | RESISTOR | 5.6KΩ,1/8W |
| R18 | NRD718J-332NYU | RESISTOR | 3.3KΩ,1/8W |
| R19 | NRD718J-222NYU | RESISTOR | 2.2KΩ,1/8W |
| R20 | NRD718J-222NYU | RESISTOR | 2.2KΩ,1/8W |
| R21 | QVZ3518-472 | V RESISTOR,RF AGC | 4.7KΩ |
| | or QVZ3523-472 | V RESISTOR | 4.7KΩ |
| R22 | NRD718J-824NYU | RESISTOR | 820KΩ,1/8W |
| R24 | NRD718J-102NYU | RESISTOR | 1KΩ,1/8W |
| R25 | NRD718J-331NYU | RESISTOR | 330Ω,1/8W |
| R27 | NRD718J-104NYU | RESISTOR | 100KΩ,1/8W |
| R28 | NRD718J-104NYU | RESISTOR | 100KΩ,1/8W |
| R31 | NRD718J-222NYU | RESISTOR | 2.2KΩ,1/8W |
| R32 | NRD718J-103NYU | RESISTOR | 10KΩ,1/8W |
| R33 | NRD718J-223NYU | RESISTOR | 22KΩ,1/8W |
| R34 | NRD718J-470NYU | RESISTOR | 47Ω,1/8W |
| R35 | NRD718J-561NYU | RESISTOR | 560Ω,1/8W |
| R36 | NRD718J-561NYU | RESISTOR | 560Ω,1/8W |
| R37 | NRD718J-121NYU | RESISTOR | 120Ω,1/8W |

| #△ REF No. | PART No. | PART NAME, DESCRIPTION | |
|---|---|---|---|
| R38 | NRD718J-182NYU | RESISTOR | 1.8KΩ,1/8W |
| R39 | NRD718J-272NYU | RESISTOR | 2.7KΩ,1/8W |
| R40 | QVZ3518-103 | V RESISTOR,COLOR LEVEL | 10KΩ |
| | or QVZ3523-103 | V RESISTOR | 10KΩ |
| R41 | NRD718J-222NYU | RESISTOR | 2.2KΩ,1/8W |
| R45 | NRD718J-471NYU | RESISTOR | 470Ω,1/8W |
| R46 | NRD718J-104NYU | RESISTOR | 100KΩ,1/8W |
| R47 | NRD718J-153NYU | RESISTOR | 15KΩ,1/8W |
| R48 | NRD718J-392NYU | RESISTOR | 3.9KΩ,1/8W |
| R49 | NRD718J-103NYU | RESISTOR | 10KΩ,1/8W |
| R50 | NRD718J-471NYU | RESISTOR | 470Ω,1/8W |
| R51 | NRD718J-223NYU | RESISTOR | 22KΩ,1/8W |
| R52 | NRD718J-223NYU | RESISTOR | 22KΩ,1/8W |
| R53 | NRD718J-103NYU | RESISTOR | 10KΩ,1/8W |
| R54 | NRD718J-682NYU | RESISTOR | 6.8KΩ,1/8W |
| R57 | NRD718J-153NYU | RESISTOR | 15KΩ,1/8W |
| R73 | NRD718J-331NYU | RESISTOR | 330Ω,1/8W |
| R74 | NRD718J-103NYU | RESISTOR | 10KΩ,1/8W |
| R82 | NRD718J-680NYU | RESISTOR | 68Ω,1/8W |
| R83 | NRD718J-331NYU | RESISTOR | 330Ω,1/8W |
| R84 | NRD718J-123NYU | RESISTOR | 12KΩ,1/8W |
| R85 | NRD718J-123NYU | RESISTOR | 12KΩ,1/8W |
| R86 | NRD718J-331NYU | RESISTOR | 330Ω,1/8W |
| R87 | NRD718J-222NYU | RESISTOR | 2.2KΩ,1/8W |
| R88 | NRD718J-103NYU | RESISTOR | 10KΩ,1/8W |
| R90 | NRD718J-103NYU | RESISTOR | 10KΩ,1/8W |
| R95 | QRD162J-470 | RESISTOR | 47Ω,1/6W |
| R97 | NRD718J-102NYU | RESISTOR | 1KΩ,1/8W |
| R101 | NRD718J-152NYU | RESISTOR | 1.5KΩ,1/8W |
| R102 | NRD718J-222NYU | RESISTOR | 2.2KΩ,1/8W |
| R103 | NRD718J-681NYU | RESISTOR | 680Ω,1/8W |
| R104 | QRD161J-393 | RESISTOR | 39KΩ,1/6W |
| R105 | NRD718J-102NYU | RESISTOR | 1KΩ,1/8W |
| C5 | NCB71HK-102NYR | CAPACITOR | 0.001μF,50V |
| C6 | NCX71CM-222NYR | CAPACITOR | 0.0022μF,16V |
| C7 | NCB71HK-102NYR | CAPACITOR | 0.001μF,50V |
| C8 | NCB71HK-102NYR | CAPACITOR | 0.001μF,50V |
| C10 | QETC1CM-336 | E CAPACITOR | 33μF,16V |
| C11 | NCY71CM-103NYR | CAPACITOR | 0.01μF,16V |
| C13 | NCX71CM-222NYR | CAPACITOR | 0.0022μF,16V |
| C14 | PU57601-474ME | E CAPACITOR | 0.47μF |
| C15 | QETC1CM-336 | E CAPACITOR | 33μF,16V |
| C16 | NCX71CM-222NYR | CAPACITOR | 0.0022μF,16V |
| C17 | NCF71EZ-223NYR | CAPACITOR | 0.022μF,25V |
| C19 | NCY71CM-103NYR | CAPACITOR | 0.01μF,16V |
| C20 | NCY71CM-103NYR | CAPACITOR | 0.01μF,16V |
| C21 | NCB71HK-101NYR | CAPACITOR | 100PF,50V |
| C22 | QETC1HM-105 | E CAPACITOR | 1μF,50V |
| C23 | QCC11EK-223 | CAPACITOR | 0.022μF,25V |
| C24 | QETC1HM-105 | E CAPACITOR | 1μF,50V |
| C25 | NCX71CM-222NYR | CAPACITOR | 0.0022μF,16V |
| C27 | QETC1HM-474 | E CAPACITOR | 0.47μF,50V |
| C28 | NCS71HJ-100NYR | CAPACITOR | 10PF,50V |

| #⚠ REF No. | PART No. | PART NAME, DESCRIPTION | |
|---|---|---|---|
| C29 | NCS71HJ-470NYR | CAPACITOR | 47PF,50V |
| C31 | QETC1HM-335 | E CAPACITOR | 3.3μF,50V |
| C32 | NCF71EZ-223NYR | CAPACITOR | 0.022μF,25V |
| C33 | QETC1HM-474 | E CAPACITOR | 0.47μF,50V |
| C50 | QETC1CM-336 | E CAPACITOR | 33μF,16V |
| C51 | NCB71HK-101NYR | CAPACITOR | 100PF,50V |
| C52 | QETC1CM-336 | E CAPACITOR | 33μF,16V |
| C56 | QETC1CM-336 | E CAPACITOR | 33μF,16V |
| C57 | QEN41CM-336 | NP E CAPACITOR | 33μF,16V |
| | or QEN61CM-336 | NP E CAPACITOR | 33μF,16V |
| C58 | NCS71HJ-100NYR | CAPACITOR | 10PF,50V |
| L2 | PU60025-1R0 | COIL | 1μH |
| L3 | PU60025-2R0 | COIL | 2μH |
| L4 | PU59152-8R2J | COIL | 8.2μH |
| L5 | PU59152-220J | COIL | 22μH |
| L6 | PU59152-6R8K | COIL | 6.8μH |
| L7 | PU59152-R22K | COIL | 0.22μH |
| L9 | PU59152-6R8K | COIL | 6.8μH |
| CF1 | PU60774-4 | CERAMIC FILTER,6.5MHZ | |
| CF3 | PU32990-2 | CERAMIC FILTER,5.5MHZ | |
| CF5 | PU32990-4 | CERAMIC FILTER,6.5MHZ | |
| CF6 | PU60774-2 | CERAMIC FILTER,5.5MHZ | |
| SAW1 | PU35557-6 | SAW FILTER | |
| T2 | PU60497 | IF.TRANSFORMER,VCO 38.9MHZ | |
| T3 | PU60864 | IF.TRANSFORMER,AFC 38.9MHZ | |
| T4 | PU60955 | IF.TRANSFORMER,SOUND DET5.5MHZ | |
| T5 | PU60046 | IF.TRANSFORMER | |
| JP1 | PU59935-16 | TERMINAL | |

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## TUNER CONTROL BOARD ASSEMBLY <08>

| #⚠ REF No. | PART No. | PART NAME, DESCRIPTION | |
|---|---|---|---|
| PWBA | PB20361C | TUNER CTL BOARD ASSEMBLY | |
| ⚠ TNR1 | PERF0019 | TUNER | |
| IC1 | AN1358 | IC | |
| | or M5223P | IC | |
| IC2 | CAT93C46P | IC | |
| Q2 | 2SD1863(QR) | TRANSISTOR | |
| | or 2SC3243D,E | TRANSISTOR | |
| Q3 | 2SB810H,J | TRANSISTOR | |
| Q4 | DTC144ES | TRANSISTOR | |
| | or UN4213 | TRANSISTOR | |
| | or 2SC3399 | TRANSISTOR | |
| Q5 | 2SC1740(S) | TRANSISTOR | |
| | or 2SC3311A(S) | TRANSISTOR | |
| | or 2SC536SPA(G) | TRANSISTOR | |
| Q7 | UN4319VI | TRANSISTOR | |
| Q8 | UN4319VI | TRANSISTOR | |
| Q9 | UN4319VI | TRANSISTOR | |
| D1 | HZT33-02 | ZENER DIODE | |
| D2 | E-103 | DIODE | |
| D3 | RD5.6ES-T1B1 | ZENER DIODE | |
| | or MTZ5.6A | ZENER DIODE | |
| D4 | 1SS133 | DIODE | |
| D5 | 1SS133 | DIODE | |
| R1 | QRD161J-103 | RESISTOR | 10KΩ,1/6W |
| R2 | QRD161J-104 | RESISTOR | 100KΩ,1/6W |
| R7 | QRD161J-102 | RESISTOR | 1KΩ,1/6W |
| R8 | QRD161J-153 | RESISTOR | 15KΩ,1/6W |
| R9 | QRD161J-182 | RESISTOR | 1.8KΩ,1/6W |
| R10 | QRD161J-103 | RESISTOR | 10KΩ,1/6W |
| R11 | QRD161J-103 | RESISTOR | 10KΩ,1/6W |
| R12 | QRD161J-333 | RESISTOR | 33KΩ,1/6W |
| R13 | QRD161J-103 | RESISTOR | 10KΩ,1/6W |
| R14 | QRD161J-103 | RESISTOR | 10KΩ,1/6W |
| R15 | QRD161J-153 | RESISTOR | 15KΩ,1/6W |
| R16 | QRD161J-154 | RESISTOR | 150KΩ,1/6W |
| R17 | QRD161J-154 | RESISTOR | 150KΩ,1/6W |
| R18 | QRD161J-394 | RESISTOR | 390KΩ,1/6W |
| R19 | QRD161J-331 | RESISTOR | 330Ω,1/6W |
| R20 | QRD161J-333 | RESISTOR | 33KΩ,1/6W |
| R21 | QRD161J-103 | RESISTOR | 10KΩ,1/6W |
| R22 | QRD161J-103 | RESISTOR | 10KΩ,1/6W |
| R33 | QRD161J-472 | RESISTOR | 4.7KΩ,1/6W |
| R35 | QRD161J-103 | RESISTOR | 10KΩ,1/6W |
| R36 | QRD161J-103 | RESISTOR | 10KΩ,1/6W |
| R37 | QRD161J-103 | RESISTOR | 10KΩ,1/6W |
| R38 | QRD161J-103 | RESISTOR | 10KΩ,1/6W |
| R39 | QRD161J-472 | RESISTOR | 4.7KΩ,1/6W |
| R40 | QRD161J-472 | RESISTOR | 4.7KΩ,1/6W |
| R41 | QRD161J-472 | RESISTOR | 4.7KΩ,1/6W |
| C1 | QETC1CM-336 | E CAPACITOR | 33μF,16V |
| C2 | QEK61HM-225 | E CAPACITOR | 2.2μF,50V |
| C3 | QETC1HM-105 | E CAPACITOR | 1μF,50V |
| C12 | QCBB1HK-102 | CAPACITOR | 0.001μF,50V |
| C13 | QETC1CM-336 | E CAPACITOR | 33μF,16V |
| C14 | QETC1CM-336 | E CAPACITOR | 33μF,16V |
| C15 | QETC1CM-107 | E CAPACITOR | 100μF,16V |
| C16 | QETC1CM-106 | E CAPACITOR | 10μF,16V |

| #⚠ REF No. | PART No. | PART NAME, DESCRIPTION | |
|---|---|---|---|
| C17 | QCSB1HJ-100 | CAPACITOR | 10PF,50V |
| C18 | QFV71HJ-153 | TF CAPACITOR | 0.015μF,50V |
| C19 | QFV71HJ-333 | TF CAPACITOR | 0.033μF,50V |
| C20 | QFV71HJ-153 | TF CAPACITOR | 0.015μF,50V |
| C21 | QFV71HJ-333 | TF CAPACITOR | 0.033μF,50V |
| C22 | QCVB1CM-103 | CAPACITOR | 0.01μF,16V |
| C23 | QETC1HM-106 | E CAPACITOR | 10μF,50V |
| C27 | QETC1CM-106 | E CAPACITOR | 10μF,16V |
| C28 | QEK61HM-474 | E CAPACITOR | 0.47μF,50V |
| C30 | QETC1CM-106 | E CAPACITOR | 10μF,16V |
| C31 | QETC1CM-106 | E CAPACITOR | 10μF,16V |
| C32 | QETC1CM-106 | E CAPACITOR | 10μF,16V |
| L1 | PU59152-R22K | COIL | 0.22μH |
| L2 | PU59152-6R8J | COIL | 6.8μH |
| | or PU59152-6R8K | COIL | 6.8μH |
| L5 | PU59152-100J | COIL | 10μH |
| L7 | PU59152-2R7K | COIL | 2.7μH |
| HD1 | PU36416-1-3 | HOLDER | |
| CN1 | PU58844-7 | CAP HOUSING | |
| CN2 | PU58844-12 | CAP HOUSING | |
| ⚠ CP1 | ICP-F10 | CIRCUIT PROTECTOR | |

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## AUDIO CONTROL HEAD BOARD <12>

| | | |
|---|---|---|
| PWB1 | PB40068 | AUDIO CONTROL HEAD BOARD |
| CN1 | PU58844-107 | CAP HOUSING |

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## TIMER/DISPLAY//SW BOARD ASSEMBLY <21>

| | | |
|---|---|---|
| PWBA | PB10352F | T/D/S BOARD ASSEMBLY |

| #⚠ REF No. | PART No. | PART NAME, DESCRIPTION | |
|---|---|---|---|
| IC1 | UPD75216ACW-B04 | IC | |
| | or UPD75P216ACWB04 | IC | |
| IC2 | IC-PST523H-2 | IC | |
| IC101 | GP1U541X | INFRARED RAYS UNIT | |
| | or GP1U521 | INFRARED RAYS UNIT | |
| | or GP1U521X | INFRARED RAYS UNIT | |
| Q1 | 2SC3199(G)-TJK | TRANSISTOR | |
| | or 2SC3311A(RS) | TRANSISTOR | |
| D1 | RD9.1ES-T1B2 | ZENER DIODE | |
| D2 | 1SS133 | DIODE | |
| D3 | 1SS133 | DIODE | |
| D4 | 11ES2 | DIODE | |
| D5 | 11ES2 | DIODE | |
| D6 | 11ES2 | DIODE | |
| | or ERA15-02 | DIODE | |
| D101 | SLH-56VC3F | LE DIODE,POWER | |
| D102 | SLH-34MC3F | LE DIODE,PLAY | |
| D103 | SLH-34DC3F | LE DIODE,PAUSE | |
| D104 | SLH-34VC3F | LE DIODE,REC | |
| D105 | SLH-34MC3F | LE DIODE,AUTO TRACK | |
| D111 | 1SS132 | DIODE | |
| D112 | 1SS132 | DIODE | |
| D115 | 1SS132 | DIODE | |
| D116 | 1SS132 | DIODE | |
| D117 | 1SS132 | DIODE | |
| D118 | 1SS132 | DIODE | |
| D123 | 1SS132 | DIODE | |
| D124 | 1SS132 | DIODE | |
| D129 | 1SS132 | DIODE | |
| D140 | 1SS132 | DIODE | |
| R1 | QRD161J-103 | RESISTOR | 10KΩ,1/6W |
| R2 | QRD161J-472 | RESISTOR | 4.7KΩ,1/6W |
| R3 | QRD161J-273 | RESISTOR | 27KΩ,1/6W |
| R4 | QRD161J-682 | RESISTOR | 6.8KΩ,1/6W |
| R5 | QRD161J-333 | RESISTOR | 33KΩ,1/6W |
| R6 | QRD161J-333 | RESISTOR | 33KΩ,1/6W |
| R7 | QRD162J-102 | RESISTOR | 1KΩ,1/6W |
| R8 | QRD161J-103 | RESISTOR | 10KΩ,1/6W |
| R9 | QRD161J-103 | RESISTOR | 10KΩ,1/6W |
| R10 | QRD161J-103 | RESISTOR | 10KΩ,1/6W |
| R11 | QRD161J-103 | RESISTOR | 10KΩ,1/6W |
| R12 | QRD161J-333 | RESISTOR | 33KΩ,1/6W |
| R13 | QRD161J-271 | RESISTOR | 270Ω,1/6W |
| R14 | QRD161J-271 | RESISTOR | 270Ω,1/6W |
| R15 | QRD161J-103 | RESISTOR | 10KΩ,1/6W |
| R16 | QRD161J-103 | RESISTOR | 10KΩ,1/6W |
| R17 | QRD161J-472 | RESISTOR | 4.7KΩ,1/6W |
| R25 | QRD161J-103 | RESISTOR | 10KΩ,1/6W |
| R26 | QRD161J-103 | RESISTOR | 10KΩ,1/6W |

| #⚠ REF No. | PART No. | PART NAME, DESCRIPTION | |
|---|---|---|---|
| R30 | QRD161J-224 | RESISTOR | 220KΩ,1/6W |
| R31 | QRD161J-151 | RESISTOR | 150Ω,1/6W |
| R32 | QRD161J-271 | RESISTOR | 270Ω,1/6W |
| R33 | QRD161J-271 | RESISTOR | 270Ω,1/6W |
| R101 | QRD161J-271 | RESISTOR | 270Ω,1/6W |
| R102 | QRD161J-271 | RESISTOR | 270Ω,1/6W |
| R103 | QRD161J-271 | RESISTOR | 270Ω,1/6W |
| R104 | QRD161J-271 | RESISTOR | 270Ω,1/6W |
| R105 | QRD161J-271 | RESISTOR | 270Ω,1/6W |
| RA1 | QRB047J-333 | RESISTOR ARRAY | |
| | or QRB049J-333 | RESISTOR ARRAY | |
| RA2 | QRB077J-104 | RESISTOR ARRAY | |
| | or QRB079J-104 | RESISTOR ARRAY(NETWORK) | |
| C3 | QCVC1CN-103 | CAPACITOR | 0.01μF,16V |
| C4 | QER61CM-106 | E CAPACITOR | 10μF,16V |
| C5 | QEA40HZ-105 | E CAPACITOR | 1F,5.5V |
| C6 | QAT3123-200 | TRIMMER CAP,TIMER CLOCK | |
| C7 | QCSB1HJ-120 | CAPACITOR | 12PF,50V |
| C11 | QER61CM-106 | E CAPACITOR | 10μF,16V |
| C13 | QCVB1CN-103 | CAPACITOR | 0.01μF,16V |
| C14 | QER61HM-106 | E CAPACITOR | 10μF,50V |
| C15 | QCBB1HJ-101 | CAPACITOR | 100PF,50V |
| C16 | QCBB1HJ-101 | CAPACITOR | 100PF,50V |
| C17 | QCF11HP-473 | CAPACITOR | 0.047μF,50V |
| C18 | QER61CM-106 | E CAPACITOR | 10μF,16V |
| C19 | QER61CM-106 | E CAPACITOR | 10μF,16V |
| C21 | QCC11EJ-473 | CAPACITOR | 0.047μF,25V |
| ⚠ X1 | PU60226-4 | CRYSTAL RESONATOR | |
| S1 | PU60392-Z | TACT SWITCH,POWER | |
| S2 | PU60392-2Z | TACT SWITCH,STOP/EJECT | |
| S3 | PU60392-2Z | TACT SWITCH,FF/SEARCH + | |
| S4 | PU60392-2Z | TACT SWITCH,REW/SEARCH- | |
| S6 | PU60392-Z | TACT SWITCH,REC/ITR | |
| S7 | PU60392-2Z | TACT SWITCH,PLAY/X2 | |
| S8 | PU60392-Z | TACT SWITCH,PAUSE | |
| S18 | PU60392-2Z | TACT SWITCH,C.ADJ/PROG/CH PLUS | |
| S19 | PU60392-2Z | TACT SWITCH,ITR(START) | |
| S21 | PU60392-2Z | TACT SWITCH,CANCEL/SKIP/RESET | |
| S22 | PU60392-2Z | TACT SWITCH,REPEAT/STORE/C.MEM | |
| S23 | PU60392-2Z | TACT SWITCH,SELECT/SUMMER TIME | |
| S24 | PU60392-2Z | TACT SWITCH,TIMER | |
| S25 | PU60392-2Z | TACT SWITCH,SET + /TRACK + | |
| S26 | PU60392-2Z | TACT SWITCH,SET - /TRACK - | |
| S28 | PU60392-2Z | TACT SWITCH,DISPLAY OFF | |
| S30 | PU60392-2Z | TACT SWITCH,CH SET/VPS | |
| S32 | PU60392-2Z | TACT SWITCH,COUNTER/REMAIN/DATE | |

| #⚠ REF No. | PART No. | PART NAME, DESCRIPTION |
|---|---|---|
| S49 | PU60392-2Z | TACT SWITCH,CH + |
| S50 | PU60392-2Z | TACT SWITCH,CH - |
| S403 | PU58486-1-1 | SLIDE SWITCH,AFC |
| S405 | PU58487-1-1 | SLIDE SWITCH,REPEAT |
| ⚠ FDP1 | PEDP0008-04 | FLUORESCENT DISPLAY PANEL |
| CL1 | PU56729-2 | WIRE CLAMP |
| HD1 | PQ31331-1-1 | FDP HOLDER(R) |
| HD2 | PQ31330-1-1 | FDP HOLDER(L) |
| HD3 | PQM30038-2-2 | LED HOLDER,X4 |
| HD4 | PQ40795-2-2 | LED HOLDER |
| TP1 | PU56008 | TEST-PIN |
| CN1 | PU58844-104 | CAP HOUSING |
| CN2 | PU59555-10 | CAP HOUSING |
| ⚠ CP1 | ICP-F10 | CIRCUIT PROTECTOR |

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## UPPER DRUM BOARD <41>

| | | |
|---|---|---|
| PWB1 | PDM3017 | BOARD (UPPER DRUM) |

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## PRE/REC AMP BOARD ASSEMBLY <43>

| | | |
|---|---|---|
| PWBA | PB10257G | PRE/REC BOARD ASSEMBLY |
| IC1 | AN3380K | IC |
| | or AN3380NK | IC |
| Q1 | 2SA1309R,S | TRANSISTOR |
| Q2 | 2SC1740S(RS) | TRANSISTOR |
| | or 2SC3199(GB)-TJK | TRANSISTOR |

| #⚠ REF No. | PART No. | PART NAME, DESCRIPTION | |
|---|---|---|---|
| Q3 | 2SC1740S(RS) | TRANSISTOR | |
| | or 2SC3199(GB)-TJK | TRANSISTOR | |
| Q4 | 2SC1740S(RS) | TRANSISTOR | |
| | or 2SC3199(GB)-TJK | TRANSISTOR | |
| Q5 | DTC144WS | TRANSISTOR | |
| R1 | QRD161J-102 | RESISTOR | 1KΩ,1/6W |
| R2 | QRD161J-222 | RESISTOR | 2.2KΩ,1/6W |
| R3 | QRD161J-222 | RESISTOR | 2.2KΩ,1/6W |
| R4 | QRD161J-391 | RESISTOR | 390Ω,1/6W |
| R5 | QRD161J-391 | RESISTOR | 390Ω,1/6W |
| R6 | QRD161J-821 | RESISTOR | 820Ω,1/6W |
| R7 | QRD161J-222 | RESISTOR | 2.2KΩ,1/6W |
| R8 | QRD161J-222 | RESISTOR | 2.2KΩ,1/6W |
| R9 | QRD161J-102 | RESISTOR | 1KΩ,1/6W |
| R10 | QRD161J-122 | RESISTOR | 1.2KΩ,1/6W |
| R11 | QRD161J-561 | RESISTOR | 560Ω,1/6W |
| R12 | QRD161J-821 | RESISTOR | 820Ω,1/6W |
| R13 | QRD161J-122 | RESISTOR | 1.2KΩ,1/6W |
| R14 | QRD161J-332 | RESISTOR | 3.3KΩ,1/6W |
| R15 | QRD161J-103 | RESISTOR | 10KΩ,1/6W |
| R16 | QRD161J-562 | RESISTOR | 5.6KΩ,1/6W |
| R17 | QRD161J-153 | RESISTOR | 15KΩ,1/6W |
| R19 | QRD161J-561 | RESISTOR | 560Ω,1/6W |
| R20 | QRD161J-391 | RESISTOR | 390Ω,1/6W |
| R21 | QRD161J-151 | RESISTOR | 150Ω,1/6W |
| R22 | QRD161J-151 | RESISTOR | 150Ω,1/6W |
| R23 | QRV144F-4122AY | CMF RESISTOR | 41.2KΩ,1/4W |
| R24 | QRD161J-560 | RESISTOR | 56Ω,1/6W |
| C1 | QER61CM-476 | E CAPACITOR | 47μF,16V |
| C2 | QCVB1CN-103 | CAPACITOR | 0.01μF,16V |
| C3 | QCBB1HJ-121 | CAPACITOR | 120PF,50V |
| C4 | QCVB1CN-103 | CAPACITOR | 0.01μF,16V |
| C5 | QCSB1HJ-270 | CAPACITOR | 27PF,50V |
| C6 | QCSB1HK-3R9 | CAPACITOR | 3.9PF,50V |
| C7 | QCVB1CN-103 | CAPACITOR | 0.01μF,16V |
| C8 | QCSB1HJ-360 | CAPACITOR | 36PF,50V |
| C9 | QCSB1HJ-120 | CAPACITOR | 12PF,50V |
| C11 | QCVB1CN-103 | CAPACITOR | 0.01μF,16V |
| C12 | QFV41HJ-104 | TF CAPACITOR | 0.1μF,50V |
| C13 | QER51CM-476 | E CAPACITOR | 47μF,16V |
| C14 | QEE41AM-335 | TANTAL CAPACITOR | 3.3μF,10V |
| C15 | QCSB1HJ-680 | CAPACITOR | 68PF,50V |
| C16 | QCVB1CN-103 | CAPACITOR | 0.01μF,16V |
| C17 | QFV41HJ-104 | TF CAPACITOR | 0.1μF,50V |
| C18 | QER61CM-106 | E CAPACITOR | 10μF,16V |
| C19 | QCBB1HJ-820 | CAPACITOR | 82PF,50V |
| C20 | QCBB1HJ-820 | CAPACITOR | 82PF,50V |
| C21 | QER61CM-106 | E CAPACITOR | 10μF,16V |
| C22 | QCVB1CN-103 | CAPACITOR | 0.01μF,16V |
| C23 | QEE40JM-685 | TANTAL CAPACITOR | 6.8μF,6.3V |
| L1 | PU48530-101J | COIL | 100μH |
| L2 | PU59988-680JY | COIL | 68μH |
| L3 | PU59988-470JY | COIL | 47μH |
| L4 | PU59988-330JY | COIL | 33μH |
| L5 | PU59988-390JY | COIL | 39μH |
| L6 | PU48530-101J | COIL | 100μH |
| L7 | PU59988-150JY | COIL | 15μH |
| L8 | PU59988-6R8JY | COIL | 6.8μH |
| L9 | PU59988-120JY | COIL | 12μH |
| SLD1 | PQ32216-1-1 | SHIELD CASE(1) | |
| CN1 | PU58844-106 | CAP HOUSING | |
| CN2 | PU59555-104 | CAP HOUSING | |
| CN3 | PU59973-4 | CAP HOUSING | |

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## DECK TERMINAL BOARD ASSEMBLY <51>

| #⚠ REF No. | PART No. | PART NAME, DESCRIPTION | |
|---|---|---|---|
| PWBA | PB10320A-02 | DECK TERMINAL BOARD ASSEMBLY | |
| Q1 | PU60625 | END SENSOR | |
| R1 | QRD161J-202 | RESISTOR | 2KΩ,1/6W |
| R3 | QRD161J-331 | RESISTOR | 330Ω,1/6W |
| R4 | QRD161J-331 | RESISTOR | 330Ω,1/6W |
| R5 | QRD161J-331 | RESISTOR | 330Ω,1/6W |
| R7 | QRD161J-202 | RESISTOR | 2KΩ,1/6W |
| R8 | NTH5D473KB | THERMISTOR | |
| | or ERT-D2ZHK473S | NEGA THERMISTOR | |
| C1 | QCVB1CM-103 | CAPACITOR | 0.01μF,16V |
| PS1 | PS5705HR | PHOTO INTERRUPTER | |
| PS2 | PS5705HR | PHOTO INTERRUPTER | |
| CN1 | PEMC0722-017 | WIRE TRAP | |
| | or PEMC0753-017 | WIRE TRAP | |
| CN2 | PU60642 | CONNECTOR,(7PIN) | |
| CN3 | PU60640 | CONNECTOR,(4PIN) | |

| #⚠ | REF No. | PART No. | PART NAME, DESCRIPTION | |
|---|---|---|---|---|

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## LOADING MDA BOARD ASSEMBLY <55>

| #⚠ | REF No. | PART No. | PART NAME, DESCRIPTION | |
|---|---|---|---|---|
| | PWBA2 | PB10320A2-01 | LOADING MDA BOARD ASSY | |
| ⚠ | IC1 | BA6418N | IC | |
| ⚠ | | or XRA6418N | IC | |
| | C1 | QETA1CM-336 | E CAPACITOR | 33$\mu$F,16V |
| | CN1 | PU59555-104 | CAP HOUSING | |

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## CASSETTE HOUSING BOARD <56>

| #⚠ | REF No. | PART No. | PART NAME, DESCRIPTION | |
|---|---|---|---|---|
| | PWB1 | PB40041-01-01 | CASSETTE HOUSING BOARD | |
| | Q2 | PN268VI-NC | PHOTO TRANSISTOR | |
| | C1 | QCC11EJ-103 | CAPACITOR | 0.01$\mu$F,25V |
| | PHS3 | PU60629 | CASSETTE SENSOR | |
| | CN2 | PU60639 | CONNECTOR(4PIN) | |

# SECTION 6
# TECHNICAL INFORMATIONS

## 6.1 CIRCUIT CONTROL SYSTEM

1. IC601 pin function (Mechacon)

| Pin No. | Symbol | | I/O format | Label | I/O | Contents |
|---|---|---|---|---|---|---|
| 1 | Port 6 | 3 | C-MOS | LCM1 | O | LOADING MOTOR DRIVE |
| 2 | | 2 | | LCM2 | | |
| 3 | | 1 | | DRUM CTL | O | SPECIAL PB H CORRECTION |
| 4 | | 0 | | CAP CTL | | CAPSTAN MOTOR SERVO (FF/REW MODE) |
| 5 | Port 4 | 7 | N-ch OPEN DRAIN | FM DET | I | AVERAGE FM (AUTO TRACKING DATA) |
| 6 | | 6 | | THERM | | THERMIC CORRECTION |
| 7 | | 5 | | MODE SENS 1 | I | MECHANISM MODE DETECTION |
| 8 | | 4 | | MODE SENS 2 | | |
| 9 | Port 3 | 7 | | MODE SENS 3 | | |
| 10 | | 6 | | CLK | I | TM (TIMER/M-CTL CPU) bus Data : CLOCK |
| 11 | | 5 | | DATA | I/O | : 16 bit |
| 12 | | 4 | | REC SF | I | REC SAFETY SW ON: L |
| 13 | | 3 | | CAP REV | O | CAPSTAN MOTOR REV MODE: L |
| 14 | | 2 | | SERVO | O | CAPSTAN MOTOR SERVO |
| 15 | | 1 | | CAP FG | I | MODE DETECT, BACK SPACE COUNT, TAPE REMAIN |
| 16 | | 0 | | CTL PULSE | I | MODE DETECT, BLANK DETECT |
| 17 | Port 5 | 7 | C-MOS | PWM | O | TUNING DATA OUTPUT |
| 18 | | 6 | | PAUSE | O | CAPSTAN MOTOR SERVO (CAPSTAN BRAKE) |
| 19 | | 5 | | NC | – | NC |
| 20 | | 4 | | V PULSE | O | V PULSE OUTPUT (V JITTER CORRECTION) |
| 21 | P5 3/T/ED3 | | | DFF | I | DRUM ROTATION DETECT/REC TIMING CONTROL (HEAD SW) |
| 22 | CN Vss | | – | CN Vss | I | GND (ALWAYS GND) |
| 23 | RESET | | | RESET | | RESET AT CONNECT VCR TO AC |
| 24 | X IN | | | X IN | I | MAIN SYSTEM CLOCK (8 MHz) |
| 25 | X OUT | | | X OUT | O | |
| 26 | Vss | | | Vss | – | GND |
| 27 | Port 5 | 2 | C-MOS | START SENS | I | START SENSOR, LEADER TAPE DETECT (DET ON: L) |
| 28 | | 1 | | TU FG | I | REEL ROTATION DETECT, TAPE REMAIN |
| 29 | | 0 | | SP FG | | |
| 30 | Port 1 | 5 | N-ch OPEN DRAIN | R. PAUSE | I | REMOTE PAUSE (PAUSE ON: L) |
| 31 | | 4 | | CASS | I | CASSETTE SENSOR (CASS IN: ⎍) |
| 32 | | 3 | | AUX | O | AUX MODE: L |
| 33 | | 2 | | END SENS | I | END SENSOR, TRAILER TAPE DETECT (DET ON: L) |
| 34 | | 1 | | REC START | O | REC START: L |
| 35 | | 0 | | REC | O | REC MODE: L |
| 36 | Port 0 | 7 | | EE | O | EE MODE: L |
| 37 | | 6 | | P CTL | | POWER CONTROL (PWR ON: L) |
| 38 | | 5 | | P MUTE | | PICTURE MUTE CONTROL (MUTE ON: L) |
| 39 | | 4 | | SP | | SP MODE: L (NOT USED) |
| 40 | | 3 | | SYNC DET | I | SYNC DETECT (No signal: H)/PICTURE MUTE CONTROL |
| 41 | | 2 | | AFC DET | O | AFC CONTROL (ON/OFF) |
| 42 | | 1 | | TEXT | | TEXT MODE: L |
| 43 | | 0 | | A MUTE | | AUDIO MUTE CONTROL (MUTE ON: H) |
| 44 | Port 2 | 7 | C-MOS | V UP | O | MOTOR DRIVE VOLTAGE CONTROL (Norm: L) |
| 45 | | 6 | | EXP DATA | | 12 bit Serial data (TNR BAND SELECT) |
| 46 | | 5 | | TNR CTL | | TUNER CTL (ON: H) |
| 47 | | 4 | | M CE | O | MEMORY IC CHIP ENABLE |
| 48 | | 3 | | M DATA | I/O | MEMORY DATA WRITE/READ |
| 49 | | 2 | | S/M/P CLK | O | CLOCK |
| 50 | | 1 | | S. DATA | O | SERVO IC CONTROL DATA |
| 51 | | 0 | | INDEX | I/O | INDEX DATA WRITE/READ (ON: L) |
| 52 | Vcc | | | Vcc | I | for the SYSTEM CONTROL |

**Table 6-1** IC601 pin functions

## 2. IC1 pin function (Timer)

| Pin No. | Symbol | Label | I/O | Contents |
|---|---|---|---|---|
| 1 | S3 | Sd | O | SEGMENT DISPLAY DATA/KEY SCAN PULSE OUTPUT<br>/KEY SCAN PULSE OUTPUT |
| 2 | S2 | Sc | | |
| 3 | S1 | Sb | | |
| 4 | S0 | Sa | | |
| 5 | P00/INT4 | POWER DOWN | I | POWER DOWN DETECT (DETECT ON: L) |
| 6 | P01/SCK | NC | – | NC |
| 7 | P02/SD | NC | | |
| 8 | P03/SI | TEST | I | TEST POINT (CLOCK ADJUST/FDP CHECK/X10 SPEED set) |
| 9 | P10/INT0 | REMOTE | I | REMOTE DATA 16 bit SERIAL DATA (A/B code) |
| 10 | P11/INT1 | NC | – | NC |
| 11 | P12/INT2 | NC | | |
| 12 | P13/T10 | CNT PLS | I | COUNTER DATA |
| 13 | P20 | KS0 | I | KEY SCAN DATA INPUT |
| 14 | P21 | KS1 | | |
| 15 | P22 | KS2 | | |
| 16 | P23/BUZ | KS3 | | |
| 17 | P30 | TIMER DATA | I/O | TM (TIMER/M-CTL CPU) bus : 16 bit DATA |
| 18 | P31 | TIMER CLK | O | : CLOCK |
| 19 | P32 | SDA | I/O | VIDEO PROGRAMING SYSTEM: I² C Bus |
| 20 | P33 | SCL | O | VIDEO PROGRAMING SYSTEM: CLOCK |
| 21 | P60 | NC | – | NC |
| 22 | P61 | NC | | |
| 23 | P62 | NC | | |
| 24 | P63 | NC | | |
| 25 | P40 | POWER | O | LED DRIVE (LED ON: L) |
| 26 | P41 | PLAY | | |
| 27 | P42 | PAUSE | | |
| 28 | P43 | REC | | |
| 29 | PP0 | NC | – | NC |
| 30 | X1 | X1 | I | MAIN SYSTEM CLOCK (4.19 MHz) |
| 31 | X2 | X2 | O | |
| 32 | Vss | Vss | – | GND |
| 33 | XT1 | XT1 | I | GND (ALWAYS GND) |
| 34 | XT2 | NC | – | NC |
| 35 | P50 | NC | | |
| 36 | P51 | NC | | |
| 37 | P52 | AUTO TRACK | O | LED DRIVE (LED ON: L) |
| 38 | P53 | NC | – | NC |
| 39 | RESET | RESET | I | RESET AT CONNECT VCR TO AC |
| 40 | T0 | 4G | O | COLUMN DISPLAY DATA |
| 41 | T1 | 5G | | |
| 42 | T2 | 6G | | |
| 43 | T3 | 7G | | |
| 44 | T4 | 1G | | |
| 45 | T5 | 2G | | |
| 46 | T6 | 3G | | |
| 47 | T7 | 8G | | |
| 48 | T8 | 9G | | |
| 49 | T9 | 10G | – | NC |
| 50 | T10/S15/PH3 | SP | O | SEGMENT DISPLAY DATA /KEY SCAN PULSE OUTPUT<br>/KEY SCAN PULSE OUTPUT |
| 51 | T11/S14/PH2 | So | | |
| 52 | T12/S13/PH1 | Sn | | |
| 53 | T13/S12/PH0 | Sm | | |
| 54 | T14/S11 | Sl | | |
| 55 | T15/S10 | Sk | | |
| 56 | $V_{LOAD}$ | $V_{LOAD}$ | I | – 30V<br>– 5V For the FDP DRIVE |
| 57 | $V_{PRE}$ | $V_{PRE}$ | | |
| 58 | S9 | Sj | O | SEGMENT DISPLAY DATA /KEY SCAN PULSE OUTPUT<br>/KEY SCAN PULSE OUTPUT<br>/KEY SCAN PULSE OUTPUT<br>/KEY SCAN PULSE OUTPUT |
| 59 | S8 | Si | | |
| 60 | S7 | Sh | | |
| 61 | S6 | Sg | | |
| 62 | S6 | Sg | | |
| 63 | S4 | Se | | |
| 64 | $V_{DD}$ | $V_{DD}$ | I | 5V For the SYSTEM CONTROL |

**Table 6-2** IC1 pin functions